

15167



**REVISION 2**

**SUPPORT ZONE INVESTIGATION  
FIELD SAMPLING PLAN**

**ENVIRO-CHEM SUPERFUND SITE  
ZIONSVILLE, INDIANA**

**Prepared For:**

**ENVIRONMENTAL CONSERVATION AND  
CHEMICAL CORPORATION TRUST**

**Prepared By:**

**AWD TECHNOLOGIES, INC.  
PITTSBURGH, PENNSYLVANIA**

**AWD PROJECT NUMBER 2455.003**

**JULY 1994**



yellow

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

August 3, 1994

Mark Dowiak  
AWD Technologies, Inc.  
Penn Center West  
Building III, Suite 300  
Pittsburgh, PA 15276

Dear Mark:

I have received the latest version of the Support Zone Sampling Plan, dated July 14, 1993, and have determined it to be unacceptable. Therefore, I will not be reviewing it or providing you with formal comments. The United States Environmental Protection Agency (U.S. EPA) has consistently stated that the western boundary of the area to be remediated must be accurately defined. The latest Support Zone Sampling Plan does not provide for this requirement.

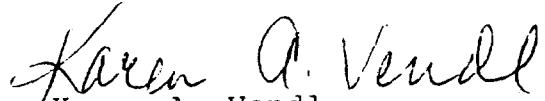
U.S. EPA has been asking how this boundary will be defined since the Site Preparation and Material Removal Design (SPMR) began over a year ago. The Agency's position has been repeated on numerous occasions, both in writing and verbally to yourself and more than one ECC Trustee. Our position and your response are summarized in Brad Grow's letter to me dated June 3, 1993. Your response at that time was "This will be addressed during Remedial Action Design." The time has now come to address this issue.

In addition to our having made substantial comments on this point during the SPMR design, the actual SPMR work uncovered 2 newly identified areas of contamination in the Support Zone, even without any concerted effort to look for additional contamination. We believe this discovery casts doubt on the rough-cut assumptions used to estimate the western site boundary and further shows the importance of defining that boundary more accurately in order to assure both the success of the remedy and the safety of operations in the Support Zone. Moreover, U.S. EPA believed from previous discussions that you agreed; your current proposal represents a retreat from those discussions and from your previous written submissions.

I remain hopeful that we can resolve this issue, especially in light of previous discussions where it appeared we had identified common ground and common goals. I suggest that to accomplish

these goals, we should meet in the near future so that we can continue advancing this project.

Sincerely,



Karen A. Vendell  
Senior Remedial Project Manager  
Office of Superfund

cc: Tom Krueger, ORC  
Jim Smith, IDEM



*A Subsidiary of  
The Dow Chemical Company*

PGH-94-MJD-642

July 14, 1994

Ms. Karen Vendl  
Remedial Project Manager  
U.S. Environmental Protection Agency  
Region V  
77 West Jackson Boulevard  
Chicago, Illinois 60604

Subject: Enviro-Chem Superfund Site  
Support Zone Investigations  
Draft Field Sampling Plan (Revision 2)  
AWD Project Number 2455.003

Dear Karen:

Enclosed are two copies of the subject plan. This plan is a further revision of the Field Sampling Plan, Revision 1, submitted in April 1994.

A copy of this plan has been submitted to Dr. James R. Smith of IDEM.

If you have any questions on this matter, please feel free to call me at (412) 788-2717.

Sincerely,

A handwritten signature in black ink that reads "Mark J. Dowiak".

Mark J. Dowiak, P.E.  
Project Manager

MJD/drP

Enclosures (2)

cc: Dr. James R. Smith, IDEM  
Mr. Timothy Harrison, CH2M Hill  
Dr. Roy O. Ball, ERM-North Central, Inc.  
Mr. Norman W. Bernstein, Arent Fox Kintner Plotkin & Kahn  
Mr. John M. Kyle III, Barnes & Thornburg

**AWD Technologies, Inc.**

Penn Center West Building 11 Suite 300 Pittsburgh Pennsylvania 15276 Telephone 412 788 2717 Fax 412 788 1316

## TABLE OF CONTENTS

<u>SECTION</u>		<u>PAGE</u>
<b>1.0</b>	<b>INTRODUCTION</b>	<b>1-1</b>
1.1	Background	1-1
1.1.1	Central Support Zone Area	1-1
1.1.2	Wastewater Storage and Decontamination Pads	1-3
1.2	Objectives of Support Zone Investigation Sampling	1-3
1.3	Project Organization	1-4
<b>2.0</b>	<b>SAMPLE LOCATIONS AND FREQUENCY</b>	<b>2-1</b>
2.1	General Sampling Approach	2-1
2.2	Central Support Zone Area	2-3
2.2.1	Phase 1 Soil Gas Sampling	2-3
2.2.2	Phase 2 Soil Gas Sampling	2-3
2.2.3	Phase 3 Soil Sampling	2-4
2.2.4	Sampling in Water-Bearing Zones	2-5
2.3	Wastewater Storage Pad Area	2-6
<b>3.0</b>	<b>SAMPLING PROCEDURES</b>	<b>3-1</b>
3.1	Soil Gas Sampling	3-1
3.2	Subsurface Soil Sampling	3-1
3.3	Preparation of Quality Assurance/Quality Control Samples	3-2
3.3.1	Field Duplicate Soil Samples	3-2
3.3.2	MS/MSD Soil Samples	3-2
3.4	Decontamination	3-3
3.5	Documentation	3-4
3.5.1	Field Notebooks	3-4
3.5.2	Soil Probe Boring Logs	3-4
<b>4.0</b>	<b>SAMPLE HANDLING AND ANALYSIS</b>	<b>4-1</b>
4.1	Sample Identification Label	4-1
4.2	Sample Seals	4-2
4.3	Chain-of-Custody Form	4-2
4.4	Sample Shipment and Custody Procedures	4-2
4.5	Analytical Procedures	4-3
4.6	Field Quality Assurance/Quality Control Procedures	4-4
4.7	Corrective Action	4-4
4.8	Data Reduction and Validation	4-4
4.9	Data Evaluation and Reporting	4-5

## **TABLE OF CONTENTS (CONTINUED)**

### **APPENDICES**

- A            CERTIFICATES OF ANALYSIS - HAND AUGER INVESTIGATION**
- B            CERTIFICATES OF ANALYSIS - DECONTAMINATION PAD AND  
WASTEWATER STORAGE PAD INVESTIGATION**
- C            SAMPLE CHAIN OF CUSTODY FORM**
- D            FIELD SAMPLING AND ANALYTICAL PROCEDURES**

## **FIGURES**

### **NUMBER**

- 1-1      Soil Sample Locations - Support Zone Investigation
- 1-2      Sampling Grids on Pads - Decontamination Pad and  
             Wastewater Storage Pad Investigation
- 2-1      Support Zone Investigations - Soil Gas  
             Sampling Locations (Phase I)

## **TABLES**

### **NUMBER**

- 1-1      Soil Sampling Headspace Results - Hand Auger Investigation
- 1-2      Soil Sampling Analytical Results - Hand Auger Investigation
- 1-3      Soil Sampling Analytical Results - Decontamination Pad  
             and Wastewater Storage Pad
- 2-1      Acceptable Soil and Soil Vapor VOC Concentrations
- 2-2      Support Zone Investigation Soil Gas Action Levels



## **1.0 INTRODUCTION**

This Field Sampling Plan (FSP) presents the methods of soil gas and soil sample collection and analyses for the proposed Support Zone Investigation (SIZ) at the Environmental Conservation and Chemical Corporation (Enviro-Chem) Site. Section 1.0 presents the results of Site Preparation and Material Removal (SPMR) soil sampling efforts undertaken in 1993, and outlines the objectives of the SIZ and the general project organization. Section 2.0 presents the sample locations and frequency. Sections 3.0 and 4.0 present sampling procedures and sample handling and analysis, respectively.

### **1.1 Background**

Construction of the SPMR commenced on September 1, 1993. The effort included the demolition of buildings and removal of debris both inside and outside the remedial boundary and construction of the support zone and support zone facilities. During excavation activities for the diversion channels along the western remedial boundary, two areas of potential contamination were located. Sections 1.1.1 and 1.1.2 describe the areas and the previous sampling efforts in each area.

#### **1.1.1      Central Support Zone Area**

On October 8, 1993, during SPMR construction, *potentially contaminated soils* were encountered during excavation of the south support zone diversion channel near the center area of the site. This finding was reported to the U.S. EPA and detailed in SPMR Monthly Progress Reports Numbers 2 and 3 which covered the period between September 11, 1993 and November 11, 1993. The location of the potential contamination is represented by a bullet symbol on Figure 1-1 and occurs in a gravel layer approximately 1 foot below grade. This layer is approximately 1/2-foot thick and was exposed during the excavation activities to a length of approximately 5 feet. After this layer was identified, the diversion channel excavation efforts in this location were stopped, the excavated channel was backfilled, the excavation equipment was decontaminated, and the area was marked with caution tape.

The Enviro-Chem Trustee Engineer (the Engineer) notified the U.S. EPA and the Indiana Department of Environmental Management (IDEM) and prepared the "Sampling and Analysis Plan for Diversion Channel Northwest of Concrete Pad" (the Hand Auger Investigation Plan) which was submitted to IDEM and the U.S. EPA on behalf of the Enviro-Chem Trustees on October 12, 1993. The U.S. EPA verbally provided comments on the plan on October 13. The Hand Auger Investigation Plan included soil boring by hand auger in the area of potential contamination, field screening by headspace analysis with an organic vapor analyzer (OVA), and laboratory analysis for Volatile Organic Compounds (VOCs) of selected soil samples. The field sampling was initiated on October 13, 1993.

The results of the field screening activities were reported in SPMR Monthly Progress Report Number 3. The screening and sampling locations, HA-1 through HA-20, are shown on Figure 1-1. Table 1-1 presents a summary of the field screening results. Auger refusal occurred in a discontinuous, packed gravel layer at the 0.5- to 1.5-foot interval at 14 of the 20 sample locations. Areal distribution of the potential contamination could not be reliably estimated by the field screening results. Without reliable field screening results to determine sample locations, one sample location in the potential contamination area and two sample locations west of the potential contamination area were selected for laboratory analysis of VOCs by using the U.S. EPA's SW-846 Method 8240A. The sampling locations were selected to establish the soil concentrations at increasing distances west of the location of potential contamination and the remedial boundary.

Soil samples obtained from locations HA-3 and HA-16 taken from the 0.5- to 1.0-foot and 1.5- to 2.0-foot intervals, respectively, and from the "source" material were submitted to Heritage Laboratories, Inc. (Heritage) of Indianapolis, Indiana. The analytical results are summarized on Table 1-2. Certificates of Analysis are included in Appendix A. The analytical results indicate that the concentrations of VOCs decrease with increasing distance west of the remedial boundary. In fact, VOCs were not detected in the HA-3 and HA-16 samples above the site-specific acceptable soil concentrations (Table 3-1 Exhibit A of the Consent Decree entered September 1, 1991, Number 83-1419 C, U.S.D.C., Southern District of Indiana).

### **1.1.2 Wastewater Storage and Decontamination Pads**

A decontamination pad and a wastewater storage pad were constructed during the SPMR project. The Independent Quality Assurance Officer collected soil samples from the base of the excavations of each pad prior to construction of the finished pads to establish the background soil concentrations.

Sample locations were determined by setting a grid on each pad excavation and randomly selecting four grid cells on each pad. The randomly selected sample locations for the wastewater storage pad and decontamination pad investigations are shown on Figure 1-1. The grids for the decontamination pad and wastewater storage pads are shown on Figure 1-2. Soil samples were collected from the base of the wastewater storage pad's collection trench area and the decontamination pad's manhole excavations. Samples were collected by hand auger from the 0.5- to 1.0-foot interval.

All soil samples were submitted to Heritage for analysis of VOCs, semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (pesticides/PCBs), barium, cadmium, chromium, lead, silver, arsenic, selenium, and mercury by U.S. EPA's SW-846 Methods 8240A, 8270A, 8080, 6010A, 305A, and 7471 (modified). Sample analytical results are summarized on Tables 1-2 and 1-3. Certificates of Analysis are included in Appendix B.

As shown on Tables 1-2 and 1-3, the site-specific acceptable soil concentrations were only exceeded in the wastewater storage pad collection trench (sump) sample. In this sample 1,1-dichloroethane was detected at 15 parts per billion (ppb).

### **1.2 Objectives of Support Zone Investigation Sampling**

Soil gas and soil samples will be taken during the support zone investigations to assess the horizontal and vertical (to 10 feet) extent of volatile organic compounds (VOCs) in the areas of the wastewater storage pad and the central support zone area.

The investigation will focus on these two areas for the following reasons:

1. Low levels of soil VOCs were detected in these two areas from samples taken during SPMR activities (Section 1.1).
2. Construction of the SPMR support zone diversion channels along the entire western Remedial Boundary indicated potential soil contamination only in the vicinity of the south support zone diversion channel near the central area of the support zone. All other sections of the diversion channel excavation did not exhibit any visible or olfactory indications of contamination, or any detectable levels of VOCs by routine organic vapor monitoring. Diversion channel excavations ranged from 2 to 4 feet below ground surface along the entire western remedial boundary.

### **1.3 Project Organization**

The Support Zone Investigation (SIZI) will be conducted by a Contractor selected by the Enviro-Chem Trustees. The Contractor shall designate a Site Manager to direct the SIZI in the field. The Contractor may also utilize subcontractors for soil borings, offsite laboratories (CLP analyses), and other services, as necessary. All SIZI activities will be overseen by the Enviro-Chem Trustees Project Manager or his designated field representative.

It is anticipated that U.S. EPA and IDEM or their designated representatives will be present during the SIZI to participate in data evaluations and field decisions for directing the SIZI.



## **2.0 SAMPLE LOCATIONS AND FREQUENCY**

This section presents the approach for determination of the sample locations and frequency for this investigation. Section 2.2 discusses sampling in the Central Support Zone Area. Section 2.3 discusses sampling in the wastewater storage pad collection trench area.

### **2.1 General Sampling Approach**

The general sampling approach for the SZI will use a three-phase procedure as follows:

- Phase 1      Soil gas sampling (in-situ) at a primary boring locations with onsite VOC analyses of soil gas.
- Phase 2      Soil gas sampling (in-situ) at secondary boring locations with onsite VOC analyses of soil gas based on the results of Phase 1.
- Phase 3      Confirmatory soil sampling at selected soil gas sample locations with offsite VOC analyses of soils.

This sampling approach is intended to estimate both the extent and the distribution of potential VOC contamination in soils within the areas of investigation.

All three investigation phases are intended to be performed during a single SZI event. Field data evaluations will be critical to determining the scope of the Phase 2 and 3 sampling, since the location and number of these samples has not been established, and is based on the results of the Phase 1 soil gas analyses. General criteria are proposed for the Phase 2 and 3 sampling, however, the number of potential scenarios for the type and distribution of contamination in the Phase 1 sampling areas preclude the application of only simple decision - making criteria, and necessitate the use of field evaluations and engineering judgement.

It is planned that the scope of the Phase 2 and 3 sampling will be coordinated onsite between the Enviro-Chem Trustees Project Manager, the Contractor's Site Manager, and representatives of the U.S. EPA and IDEM. This coordination will include joint evaluation of the Phase 1 soil gas analytical results, identification of Phase 2 soil gas sampling locations, and determination of Phase 3 confirmatory soil sample locations.

For the Central Support Zone Area, the distance between soil gas borings for the Phase 1 grid was determined by using the formula included in Instructions for the Preparation of Closure Plans for Interim Status Facilities by the Illinois Environmental Protection Agency (IEPA) - Division of Land Pollution Control, dated March 2, 1989. The formula is as follows:

$$GI = (A/\pi)^{0.5}/2$$

where:

GI      =      Grid interval in feet  
A      =      Area in square feet

For this calculation, the area of this investigation was estimated to be the limits of the field screening investigation as described in Section 1.1.1 which is approximately 100 x 150 feet, or 15,000 square feet. Using this as the total sampling area, a soil boring spacing interval of 35 feet is obtained. Based on this estimate a Phase 1 grid spacing of 50 feet and Phase 2 grid extension spacing of 25 feet were used. Figure 2-1 shows the proposed locations of Phase 1 soil gas borings.

The wastewater storage pad area will be investigated initially by three soil gas borings on the north, south, and east edges of the pad. Sample spacing is 15 to 25 feet.

All soil probe borings will be advanced to a maximum depth of 10 feet. Samples of soil gas will be collected at 2-foot intervals. The soil gas samples will be analyzed with a field gas chromatograph (GC) for the VOCs list which is presented on Table 2-1.

If subsurface conditions prevent advancement of the soil probe because of debris, boulders, or other objects that may result in boring refusal, the boring location will be abandoned. A new boring will be started within a 10-foot radius of the grid location. The exact location of the boring will be determined in the field jointly by the Enviro-Chem Project Manager, the Contractor's Site Manager, U.S. EPA, and IDEM.

Soil samples taken with the soil probe will be analyzed for VOCs at an offsite CLP-authorized laboratory. Analytical methods will be by GC/MS using the U.S. EPA approved statement of work CLP SOW Method OLM01.8 or the most recent method for the Target Compound List (TCL) VOCs.

## **2.2     Central Support Zone Area**

### **2.2.1       Phase I Soil Gas Sampling**

Phase 1 will include soil borings on a primary grid surrounding the previous hand auger sampling area (see Section 1.1.1) with soil gas analysis using a soil probing tool, such as manufactured by Geoprobe Systems Inc. (Geoprobe). Soil gas samples will be taken at discrete 2-foot intervals to a depth of 10 feet at each grid location. Soil gas will be analyzed onsite by gas chromatography to determine volatile organic compound presence/absence and quantify the VOC constituents and their vapor concentrations. The results of the Phase 1 soil gas analyses will be continuously evaluated onsite, and once the first phase grid sampling is completed, the second phase soil gas samples will be taken if necessary based on the soil gas action level criteria as described in Section 2.2.2. Soil gas sampling and analyses methods are described in Sections 3.0 and 4.0, respectively.

### **2.2.2       Phase 2 Soil Gas Sampling**

The second phase of the investigation will be an extension of the primary grid, if necessary based on the results of the Phase 1 soil gas analyses at borings on the western and southern perimeters of the grid.

The criteria to be used for extension of the grid will be a soil gas action level for the Phase 1 soil gas VOC concentrations determined by field GC analyses. A Support Zone Investigation (SIZI) soil gas action level is proposed based on the acceptable soil vapor VOC concentrations established in the Consent Decree (see Table 2-1). The SIZI soil gas action level proposed is 10 percent of the acceptable soil vapor concentrations or the detection limit of the field GC (Appendix D - Analytical Method AM4.02), whichever is higher. The SIZI soil gas action levels are presented on Table 2-2.

*what is?*

These SIZI soil gas action levels are considered appropriate criteria for identification of potential areas of soil VOC contamination because of the following reasons:

- The soil gas sampling and field analyses proposed in the SIZI provide the most representative field methods for identification of soil VOCs expected to be encountered during the actual soil vapor extraction operation and performance monitoring.
- Soil gas action levels at 10 percent reduction of the Consent Decree acceptable soil vapor concentrations provides a safety factor to account for sampling/analyses errors and the potential low-concentration bias of the discrete soil gas SIZI samples versus the SVE soil gas samples taken over a larger interval of space and time.

If the Phase 1 borings have soil gas VOCs above any of the SIZI action levels, the grid will be advanced at 25-foot increments in all grid directions (North-South or East-West) that have not had borings or have not had soil gas VOCs less than the SIZI action levels. The grid will be extended until the remedial boundary or the physical limit of the support zone is encountered on a specific grid line.

#### 2.2.3      Phase 3 Soil Sampling

*this is what they should be doing) not what's proposed*

The third phase confirmatory soil sampling will be done after the Phase I and II soil gas sampling is completed and it will also be performed by the soil probing tool. Soil samples will be taken at selected grid points within an approximately 5-foot radius of the previous soil gas boring. The specific grid points for confirmatory soil borings and the number of soil samples within each boring will be based on the results of the Phase I and II soil vapor VOC analyses.

The primary criteria for soil sampling will be confirmation of the horizontal limits of soil contamination as identified by soil vapor analyses. Soil samples will be taken to confirm both positive and non-detect VOC measurements in soil gas. A minimum of two soil samples will be taken from each grid perimeter soil gas boring area with a soil gas VOCs above the SZI action levels.

At a minimum, one soil sample will be from the upper 5-foot interval and one from the lower 5-foot interval of the 10 foot deep boring. For the grid interior borings, one soil sample will be taken from each soil gas boring area with soil gas VOCs above the SZI action levels. The sample interval will be determined in the field based on the vertical interval of soil gas VOCs and the soil gas VOC distribution in borings at adjacent grid locations.

All of the soil samples will be submitted to an offsite laboratory for CLP level VOC analyses. Soil sampling and analyses methods are described in Sections 3.0 and 4.0, respectively. The number and location of the Phase 3 soil samples will be coordinated with the Enviro-Chem Trustees Project Manager, the Contractor's Site Manager, U.S. EPA, and IDEM.

#### **2.2.4 Sampling in Water-Bearing Zones**

Water-bearing zones may be encountered in the upper 10 foot of the subsurface during site investigations. These zones may include the water table or shallower perched zones in more permeable soils, fill deposits, or possibly miscellaneous debris materials.

The presence of subsurface water may preclude Phase I and II soil gas sampling in those soil borings where the subsurface water is encountered. The in-situ soil gas sampling procedure employs a vacuum to withdraw volatile vapors from the subsurface (Appendix D - Sampling Method SMI-H). If significant free water is present, it will be drawn into the sampling tubing and prevent the volatile vapors from being sampled.

In borings where soil gas sampling cannot be conducted because of the presence of water-bearing zones, the soil probe tool will be withdrawn from the boring location and the soil gas sampling will be stopped. The sample interval where water was encountered will be noted, and the boring will be revisited and sampled for soils at 2-foot intervals from the water-bearing zone to the required depth of 10 feet. These soil samples will be taken after completion of either the Phase I or Phase II soil gas sampling, as necessary.

The soil samples will be analyzed in the field for VOC vapors by using the static headspace method (Appendix D - Analytical Method AM9.02). This procedure will be used as a substitute for in-situ soil gas sampling in water-bearing zones however, it will not be considered a substitute for the Phase III soil sampling.

The SZI soil gas action level criteria will be applied to the soil headspace analytical results in the same manner as the in-situ soil vapor analyses (Section 2.2.2) to direct either the extension of the primary sampling grid (Phase II) or determine the number of soil samples for offsite analyses (Phase III).

## 2.3 Wastewater Storage Pad Area

One compound, 1,1-dichloroethane, exceeded the acceptable concentration in the soil sample collected from the base of the wastewater storage pad collection trench excavation. Analytical results for the other soil samples collected at the wastewater storage pad and ~~west of the collection trench location~~ did not exceed the site-specific acceptable soil concentrations. Therefore, further assessment will be conducted around the north, east, and south ends of the wastewater storage pad by the installation of three Phase 1 soil gas borings (Figure 2-1).

*what  
here* The soil probe borings will be sampled for soil gas VOCs and advanced to a maximum depth of 10 feet. Samples of soil gas will be collected at 2-foot intervals of the boring. As with the Central Support Zone Area, the results of the soil gas analyses will be evaluated to determine the number of additional soil gas samples.

The Phase 2 soil gas borings, if necessary, will be based on the concentrations and vertical interval of VOCs detected in the three Phase 1 soil gas borings in addition to the existing soil sample data (Section 1.1.2). These data will be evaluated in the field jointly by the Enviro-Chem Project Manager, the Contractor's Site Manager, U.S. EPA, and IDEM to determine the number and depth of additional soil gas borings, if any.

A minimum of two soil samples will be taken from each soil gas boring area with VOCs in soil gas above any of the SZI action levels (Table 2-2). At a minimum, one soil sample will be taken from the upper 5-foot interval and one from the lower 5-foot interval of the 10 foot deep boring.



## **3.0 SAMPLING PROCEDURES**

### **3.1 Soil Gas Sampling**

Soil gas samples will be collected by use of the Geoprobe soil probe unit. Soil gas samples will be collected at intervals between 0 to 2, 2 to 4, 4 to 6, and 6 to 8 feet. The Geoprobe system advances an approximately 1 3/4-inch diameter boring by use of an hydraulic hammer which drives a threaded push rod into the subsurface until the desired sampling depth is obtained. Once the probe rods are driven to the desired depth they should be pulled up 3 to 4 inches to disengage the dive point and expose a conduit for the soil gases to be sampled. Next a pull cap from the top rod is removed and 1/4-inch polyethylene tubing with a threaded adapter is inserted into the drill rods. The adapter is then threaded into the drive point holder. Once the tubing is properly seated, the soil gas can be drawn through the tubing by use of a sampling syringe. A minimum of one tubing volume is exhausted to the atmosphere by use of a three-way valve to purge tubing and syringe prior to sample collection. After purging, soil gas is drawn into the syringe and then transferred into an evacuated ample vial which will containerize the soil gas until analyzed by onsite GC. A detailed description of the soil gas sampling procedure is contained in Appendix D as Sampling Method SMI-H.

All soil gas sampling activities will be supervised by an onsite geologist.

### **3.2 Subsurface Soil Sampling**

Subsurface soil sampling will be conducted to verify the extent and concentration of volatile organic constituents that are detected during the soil gas phase of the investigation. Sampling locations and depth intervals will be determined based upon the results of the soil gas borings.

The borings will be drilled using a truck-mounted Geoprobe system. The Geoprobe system advances an approximately 1 3/4-inch diameter boring by use of a hydraulic hammer which drives a threaded push rod into the subsurface until the desired sampling depth is attained. Soil samples are obtained by loosening the drive point of the push rod by inserting a smaller diameter threaded rod through the drilling string. This smaller diameter rod is used to turn (loosen) the drive point. A sample can then be collected by advancing the drill string with the hydraulic hammer. After collection, all drill rods are removed from the borehole. The soil sample is

contained within the drive point sampler which acts as the lead rod. The sample is collected within a clear acetate inner liner which is pushed out of the outer sampling tube. Once removed, the sample is logged and a portion containerized for offsite analysis. Logging will be conducted by the onsite field personnel utilizing the Unified Soil Classification System (USCS).

Appendix D contains a detailed description of Geoprobe Soil Sampling Method SM-5.

### **3.3 Preparation of Quality Assurance/Quality Control Samples**

Quality Assurance/Quality Control (QA/QC) samples will be collected for the Phase III soil confirmation samples. The frequency of QA/QC samples will be: (1) one sample will be designated for MS/MSD analysis for every 20 or fewer samples, and (2) one duplicate will be collected for every 10 or fewer soil samples.

#### **3.3.1 Field Duplicate Soil Samples**

Duplicate soil samples will be collected in accordance with the procedure described below:

1. The investigative sample location from which a duplicate sample will be collected will be determined.
2. A duplicate sample will be obtained from the same acetate liner containing the sample to be analyzed. The sample will be divided in half longitudinally utilizing a stainless steel trowel. Each divided half will comprise the sample and its duplicate. The samples will not be mixed or composited but will be inserted into the container in a manner which least disturbs the soil matrix.
3. The field notebook, labels, tags, and chain-of-custody sheets will be filled out with the duplicate sample properly designated and logged.

#### **3.3.2 MS/MSD Soil Samples**

The soil samples designated for MS/MSD analysis will be collected following the same procedure as other investigative samples. No extra sample volume is required. The investigative samples selected for MS/MSD analysis will be properly designated and logged on

the chain-of-custody sheets, labels, tags, and in the field notebook. MS/MSD samples will be preserved, handled, and shipped following the same procedures as investigative samples.

### **3.4 Decontamination**

All sampling equipment will be decontaminated prior to collection of each sample. Sampling gloves will be discarded after collecting each sample. Decontamination of field personnel will be conducted in accordance with the procedures specified in the SPMR Health and Safety Plan. Temporary exclusion zones and contamination reduction zones will be established by the Site Manager in accordance with the site HASP. Equipment will be decontaminated either near the sample location in heat-resistant plastic tubs or on the concrete decontamination pad in the support zone.

A pump will be used to remove contaminated water from the decontamination pad into drums that will be relocated to the drum storage area on the concrete pad.

Decontamination of the soil probes and other sampling equipment will be conducted according to the following procedure:

- Step 1 - Wash equipment with a solution of Alconox or phosphate detergent mixed with potable water
- Step 2 - Rinse with potable water
- Step 3 - Rinse with ethanol
- Step 4 - Rinse twice with distilled water
- Step 5 - Air dry
- Step 6 - Place in clean polyethylene bag or wrap in aluminum foil with shiny side out when not in use and during transport

Drilling rods will be decontaminated by steam cleaning or the above procedure prior to each new boring.

The polyethylene tubing used for collection of soil gas samples will be discarded after each use and will not be decontaminated.

### **3.5 Documentation**

All field measurements and observations will be recorded in both a field notebook and on the soil boring logs. Field measurements will include: distances, depths, and organic vapor concentrations. Field observations will consist of: weather conditions, physical appearance of samples, description of all field tasks undertaken, and a list of all personnel on site.

#### **3.5.1      Field Notebooks**

The field notebooks will be permanently labeled with the site name, site location, internal project number, and notebook number. Telephone numbers of key project personnel and safety agencies, such as the fire department, hospital, and police, will be indicated in each field notebook.

Each page in the field notebook will be numbered and dated at the time of use, and initialed at the bottom by the user. Daily entries will begin with a synopsis of weather conditions, field conditions, personnel present, and projected work tasks for the day. All field tasks completed and the status of tasks in progress will be recorded in the field notebook. Entries will include all field measurements, calibration and preventive maintenance of field instruments, sampling locations, type of sample, sample number, physical appearance of sample, and the names of sampling personnel. No erasing will be allowed, and corrections will be made by drawing a single line through the incorrect entry. All corrections of recorded data will be initialed and dated.

#### **3.5.2      Soil Probe Boring Logs**

Field measurements and detailed documentation of sampling will be recorded on soil probe boring field data forms that will identify the site, sampling personnel, location of the sample, field classification of materials encountered, and all other field measurements obtained. Field classification of materials encountered will not be required for the soil gas borings as no soil samples are anticipated to be collected from these borings.

As with the field notebook, any corrections on the field data forms will be made by drawing a single line through the incorrect entry and initialing and dating the correction.



## 4.0 SAMPLE HANDLING AND ANALYSIS

Soil samples will be submitted for offsite analyses for TCL VOCs by using the most recent U.S. EPA-approved version of CLP SOW OLM01.8.

### 4.1 Sample Identification Label

Sample identification labels will include the following information:

- Sample designation
- Name of collector
- Affiliation of collector
- Date and time of collection
- Field GC or laboratory
- Requested analysis
- Analysis code

*I hold these up  
they need to be based  
on a QSPP we can  
use with a work plan we've had  
a lot of trouble with it  
a lot of work plan #2  
(which was sample  
the whole way around)*

Each sample taken during the execution of this plan will be given a sample designation. The sample designation will be as follows:

EC	=	Enviro-Chem
B##	=	Soil probe boring number (to be determined in the field)
A,B,C,..	=	Depth interval (A for 0 to 2 feet, B for 2 to 4 feet, C for 4 to 6 feet, etc.)
S or G	=	Soil sample or soil gas sample
F or L	=	Field GC or L for laboratory analysis

A soil gas sample collected at the 4- to 6-foot depth interval from soil boring number 2 submitted to the field GC analysis would be labeled as "ECB02CGF". A soil sample collected at the 0- to 2-foot depth interval from soil boring 11 submitted to the offsite laboratory would be labeled "ECB11ASL". Information from the sample identification labels will be recorded in the field notebook to document all analytical samples. In addition, the soil boring grid coordinate will be recorded as identified by field survey (see Figure 2-1).

#### **4.2    Sample Seals**

If the soil samples are to be transported by a carrier, the cooler containing the samples will be sealed to prevent disturbance of the samples during transportation. The seal will be affixed in such a manner that it would be broken if the cooler were to be opened. Upon receipt of the samples, the laboratory will check the integrity of the seal.

#### **4.3    Chain-of-Custody Form**

To provide documentation necessary to trace sample possession from the time of collection to the time of receipt by the analytical laboratory, a chain-of-custody record will be completed and accompany each shipment of sample(s) to the laboratory. Chain-of-custody procedures are discussed in Section 4.4. A copy of the sample chain-of-custody form is included in Appendix C. Copies will be stored in the project files.

#### **4.4    Sample Shipment and Custody Procedures**

Sample custody procedures will be consistent with the U.S. EPA Region V Guidance "Content Requirements for Quality Assurance Project Plans."

A sample will be considered under the person's custody if it is: (1) in a person's physical possession, (2) in view of the person after taking possession, (3) secured by that person so that no one can tamper with the sample, or (4) secured by that person in an area that is restricted to authorized personnel. The sample packaging and shipment procedures summarized below will assure that the sample will arrive at the laboratory with the chain-of-custody intact.

Field procedures are as follows:

- The field sampler will be personally responsible for the care and custody of the samples until they are transferred or properly dispatched. As few people as possible will handle the samples.

- All samples will be tagged with sample numbers and locations.
- Sample tags will be completed for each sample using waterproof ink unless prohibited by weather conditions.

Transfer-of-custody and shipment procedures will be as follows:

- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the records. This record documents the transfer of custody of samples from the sampler to another person, to the chemist operating the field GC analytical unit, to the offsite laboratory, or to/from a secure storage area.
- Samples will be properly packaged for shipment and dispatched via overnight courier or hand delivered to the GC operator or laboratory for analysis, with a separate, signed custody record enclosed in a cooler. Shipping containers will be secured with packing tape and custody seals for shipment to the laboratory.
- The original chain-of-custody record and the yellow and pink copies will accompany the shipment. The gold copy will be retained by the samplers and returned to the field office.

The specifications for chain-of-custody and document control for the analytical laboratory will be discussed in the QAPP.

#### **4.5 Analytical Procedures**

Field GC analyses of soil gas (in-situ) and soil headspace vapor are described in Appendix D - Analytical Methods AM4.02 and AM9.02.

Soil samples will be submitted to the offsite laboratory for confirmatory analysis of TCL VOCs by using the most recent U.S. EPA-approved version of CLP SOW OLM01.8. The requirements for precision, accuracy, completeness, representativeness, and comparability will be described in the QAPP.

#### **4.6 Field Quality Assurance/Quality Control Procedures**

The QA/QC procedures will be followed to ensure the reliability and validity of the field and analytical data obtained during the investigation.

Field QA/QC procedures include calibration of field instruments and collection of field duplicate and MS/MSD samples. MS/MSD and field duplicate samples will be prepared as described in Section 3.2.

The Contractor's Site Manager will monitor and audit the performance of field QA/QC procedures by reviewing the detailed description of sample collection and field measurement procedures recorded in the field notebook to ensure that this investigation is executed in accordance with this FSP.

#### **4.7 Corrective Action**

If a problem occurs in the field that is immediately correctable by direct action, then the Contractor's Site Manager will see that the action is taken. For example, if poor sampling techniques are observed when collecting a sample, the Site Manager will order the recollection of a new sample and indicate the steps to be taken to prevent a reoccurrence of the problem.

Some problems are not immediately correctable in the field. If such a problem is encountered, the Site Manager will contact the Enviro-Chem Project Manager, who will then determine the appropriate corrective action in consultation with the U.S. EPA and IDEM, if necessary.

#### **4.8 Data Reduction and Validation**

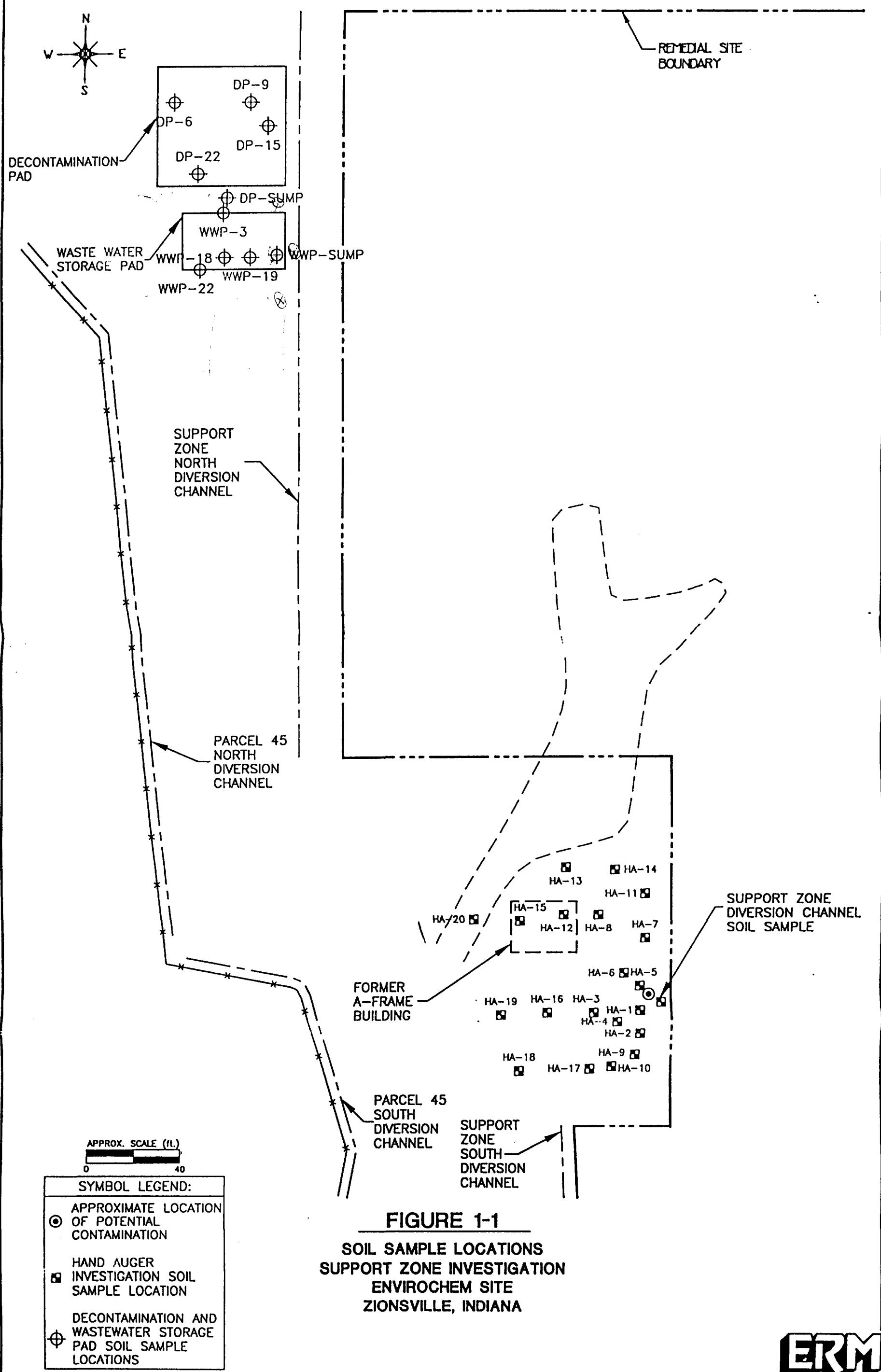
Offsite laboratory analytical data reduction will be carried out by the laboratory following the procedures in the most recent U.S. EPA-approved versions of the CLP SOWs. Analytical data validation will be performed by the SZI Contractor using the U.S. EPA National Functional

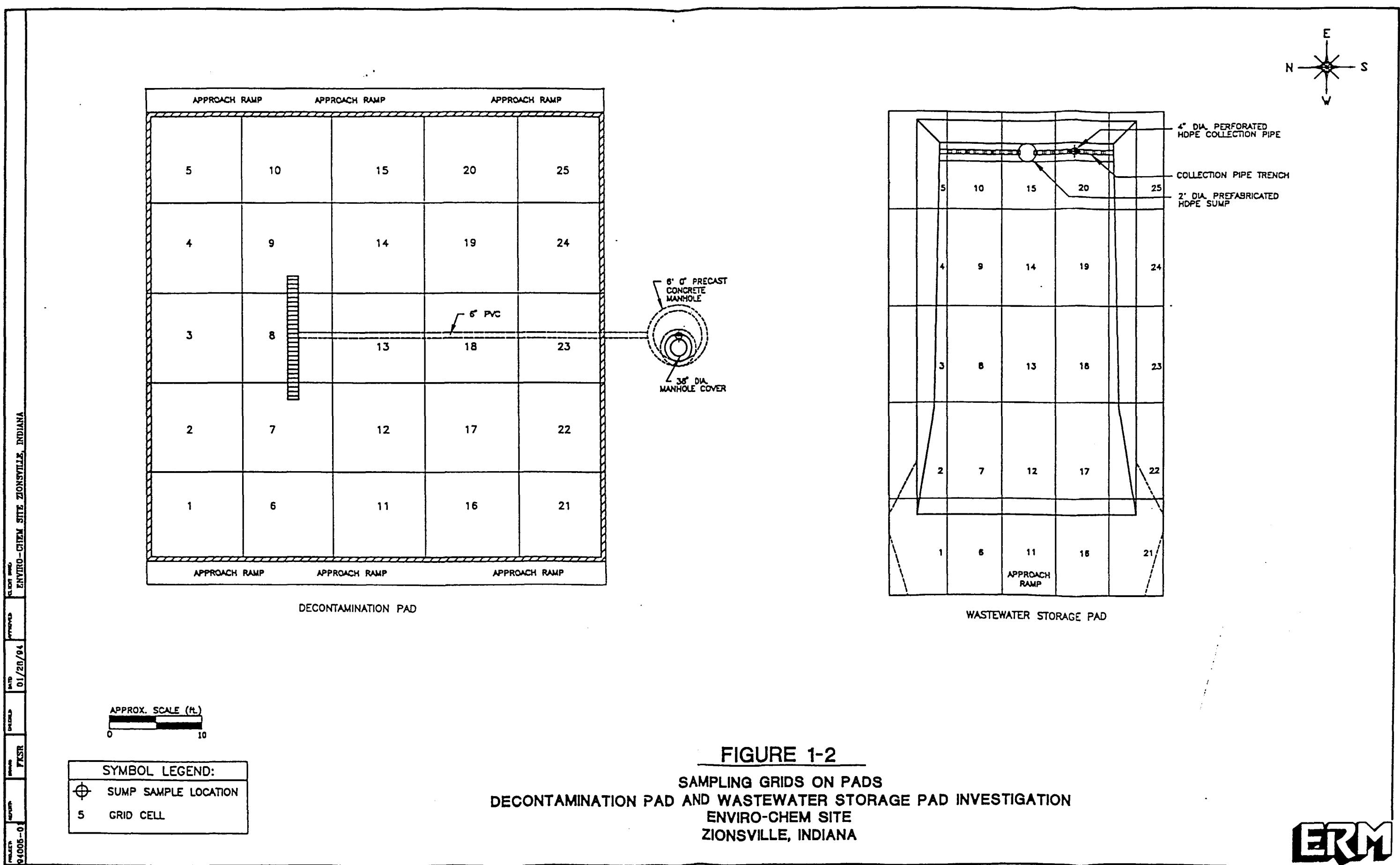
**Guidelines.** Additionally, the laboratory performing the analysis of the chemical parameters will critique its own analytical program by using spiked addition recoveries, established detection limits, and precision and accuracy control charts where applicable, and by keeping accurate records of the calibration of instruments as described in the most recent U.S. EPA-approved version of the CLP SOWs. Data reduction and validation procedures will be described in the QAPP. The laboratory will provide documentation to meet the requirements of the QAPP.

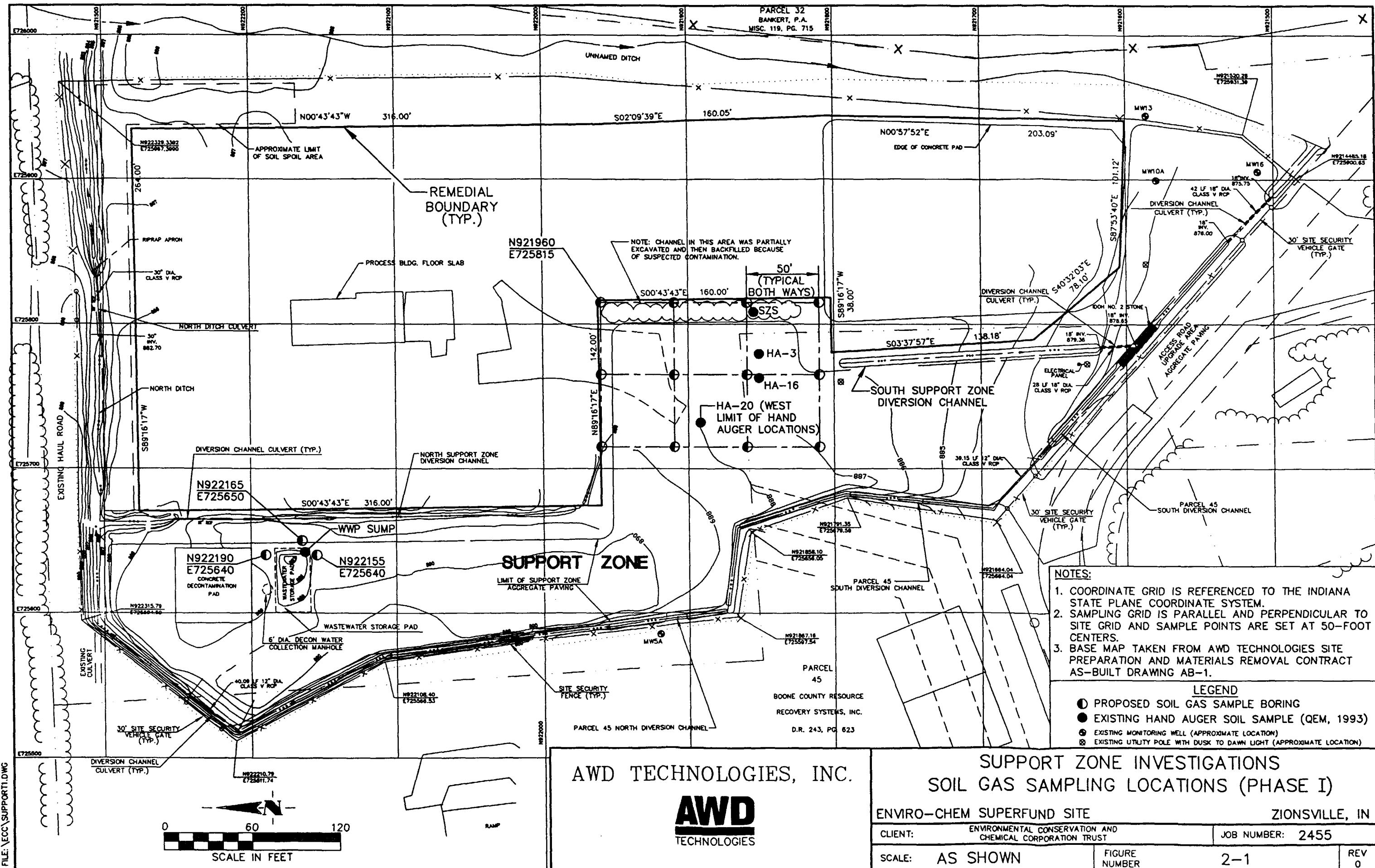
#### **4.9 Data Evaluation and Reporting**

Field and analytical data will be evaluated, summarized, and presented in a report to the U.S. EPA 75 days after the completion of the field activities. Detected soil gas and soil concentrations will be compared with the site-specific soil gas and soil acceptable concentrations. The report will also include a description of all field activities, analytical procedures, and any modifications to this Field Sampling Plan.

## **FIGURES**







## TABLES

TABLE 1-1

**SOIL SAMPLING HEAD SPACE RESULTS  
HAND AUGER INVESTIGATION (1)  
ENVIROCHEM SITE  
ZIONSVILLE, INDIANA**

DEPTH BGS (feet)	HA-1 OVA READINGS	HA-2 OVA READINGS	HA-3 OVA READINGS	HA-4 OVA READINGS	HA-5 OVA READINGS	HA-6 OVA READINGS	HA-7 OVA READINGS	HA-8 OVA READINGS	HA-9 OVA READINGS	HA-10 OVA READINGS
0.0 - 0.5	10	24	1	0	7	50	40	>1,000	62	1
0.5 - 1.0	220	NS AR	1.5 S	0	>1,000	220	79	>1,000	9	0
1.0 - 1.5	NS AR	NS	NS	0	NS AR	NS AR	NS AR	NS AR	0	20
1.5 - 2.0	NS	NS	3	0.5	NS	NS	NS	NS	0	10
2.0 - 2.5	NS	NS	NS	0.5	NS	NS	NS	NS	1	34
2.5 - 3.0	NS	NS	16	0	NS	NS	NS	NS	3	50
3.0 - 3.5	NS	NS	NS	1.5	NS	NS	NS	NS	6	200
3.5 - 4.0	NS	NS	0.5	4.5	NS	NS	NS	NS	NS AR	850
4.0 - 4.5	NS	NS AR								
4.5 - 5.0	NS	NS	1	NS						

DEPTH BGS (feet)	HA-11 OVA READINGS	HA-12 OVA READINGS	HA-13 OVA READINGS	HA-14 OVA READINGS	HA-15 OVA READINGS	HA-16 OVA READINGS	HA-17 OVA READINGS	HA-18 OVA READINGS	HA-19 OVA READINGS	HA-20 OVA READINGS
0.0 - 0.5	2	4	NS AR	NS AR	23	15	55	58	600	34
0.5 - 1.0	NS AR	42	NS	NS	9	33	NS AR	14	>1000	97
1.0 - 1.5	NS AR	NS AR	NS	NS	NS AR	700	NS	NS AR	620	NS AR
1.5 - 2.0	NS	NS	NS	NS	NS	1000 S	NS	NS	400	NS
2.0 - 2.5	NS	NS	NS	NS	NS	300	NS	NS	NS AR	NS
2.5 - 3.0	NS	NS	NS	NS	NS	210	NS	NS	NS	NS
3.0 - 3.5	NS	NS	NS	NS	NS	280	NS	NS	NS	NS
3.5 - 4.0	NS	NS	NS	NS	NS	110	NS	NS	NS	NS
4.0 - 4.5	NS									
4.5 - 5.0	NS									

**Key:**

OVA = Organic vapor analyzer.

NS = No sample.

BGS = Below ground surface.

S = Sample collected

AR = Auger refusal

**Note:**

(1) OVA headspace readings in Volumetric parts per million.

**TABLE 1-2**  
**SOIL SAMPLING ANALYTICAL RESULTS**  
**HAND AUGER INVESTIGATION**  
**ENVIROCHEM SITE**  
**ZIONSVILLE, INDIANA**

PARAMETERS	Acceptable Concentration (1)	Support Zone Sample	HA-3 0.5-1.0'	HA-16 1.5-2.0'
<b>Volatile Organic Compounds (2)</b>				
Methylene chloride	20	42	8	5
Toluene	238000	75	20	6
1,1,1-Trichloroethane	7200	710	74	11
Trichloroethene	240	73	21	7
Tetrachloroethene	130	320	ND	ND

**Key:**

HA = Hand auger sample.

ND = Not detected.

**Notes:**

(1) Reference: Table 3-1 Exhibit A Consent Decree.

(2) EPA Method (SW846-8240A) soil concentration in (ug/kg).

**TABLE 1-3**  
**SOIL SAMPLING ANALYTICAL RESULTS**  
**DECONTAMINATION PAD AND WASTE WATER STORAGE PAD**  
**ENVIROCHEM SITE**  
**ZIONSVILLE, INDIANA**

PARAMETERS	Mean (1)	Acceptable Concentration (2)	WWP-sump	WWP-3	WWP-18	WWP-19	WWP-22	DP-sump	ECC-DP-06	ECC-DP-009	ECC-DP-15	ECC-DP-15DUP	ECC-DP-22
<b>Volatile Organic Compounds (3)</b>													
Acetone	-	490	75	ND	ND	65	ND	ND	ND	ND	ND	ND	ND
Benzene	-	-	6	ND	ND	ND	ND	ND	ND	10	7	9	ND
Chloroethane	-	-	32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	-	5.7	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	-	234000	330	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	-	20	7	11	7	8	ND	13	10	14	10	13	8
Toluene	-	238000	25	16	ND	10	6	ND	ND	ND	ND	ND	7
1,1,1-Trichloroethane	-	7200	34	73	27	28	28	ND	ND	35	32	60	10
Trichloroethene	-	240	6	32	7	10	8	ND	ND	79	93	130	49
Xylene	-	195000	100	ND	ND	ND	ND	ND	ND	16	9	ND	10
Tetrachloroethene	-	130	ND	ND	ND	ND	ND	ND	ND	10	10	11	ND
Trichloro-trifluoroethane	-	-	-	-	-	-	-	15	-	-	-	-	-
<b>Semivolatile Organic Compounds (4)</b>													
SVOCs	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>Polychlorinated Biphenyls/Pesticides (5)</b>			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>Inorganics (6)</b>													
Arsenic	16.8	-	2.7	4.6	4.4	5.8	4.8	3.7	5.4	83	91	92	4
Barium	97.2	-	40	40	46	76	37	27	33	42	56	58	54
Cadmium	-	-	ND	ND	9.7	ND	ND	ND	1.6	79	37	35	22
Chromium	17.7	-	11	8.9	ND	16	7.8	7.5	7	28	1.9	1.9	12
Lead	16.8	-	9	8.8	12	12	8.2	6.5	5.8	14	82	7.7	12
Mercury	-	-	ND	ND	ND	ND	ND	ND	ND	12	5.7	6.9	ND
Selenium	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

**Key:**

ND = Not detected.

NA = Not analyzed.

- = No value.

HA = Hand auger sample.

WWP = Wastewater storage pad sample.

DP = Decontamination Pad sample.

**Notes:**

(1) On-Site Upper 95% Confidence Interval of the Mean; Reference: EnviroChem Remedial Investigation Report (1983).

(2) Reference: Table 3-1 Exhibit A Consent Decree.

(3) EPA Method (SW846-8240A) soil concentration in (ug/kg).

(4) EPA Method (SW846-8270A) soil concentration in (ug/kg).

(5) EPA Method (SW846-8080) soil concentration in (ug/kg).

(6) Inorganics soil concentration in (mg/kg)

TABLE 2-1

**ACCEPTABLE SOIL AND SOIL VAPOR VOC CONCENTRATIONS  
ENVIROCHEM SUPERFUND SITE  
ZIONSVILLE, INDIANA**

VOC Compound	Acceptable Soil <sup>(1)</sup> Concentration ( $\mu\text{g}/\text{kg}$ )	Acceptable Soil Vapor <sup>(2)</sup> Concentration (PPMV)
Acetone	490	254
Chloroform	2,300	496
1,1-Dichloroethane	5.7	3.4
1,1-Dihloroethene	120	515
Ethylbenzene	234,000	9,316
Methylene Chloride	20	22.4
Methyl Ethyl Ketone	75	13
Methyl Isobutyl Ketone	8,900	233
Tetrachloroethene	130	16.8
Toluene	238,000	36,556
1,1,1-Trichloroethane	7,200	2,819
1,1,2-Trichloroethane	22	1.1
Trichloroethene	240	71.5
Total Xylenes	195,000	4,794
Vinyl Chloride <sup>(3)</sup>	1.9	
1,2-Dichloroethane <sup>(3)</sup>	34.2	
Chloroethane <sup>(3)</sup>	---	
1,2-Dichloroethene <sup>(3)</sup>	514	
1,2-Dichlorobenzene <sup>(3)</sup>	349,807	

Notes

(1) ECC Superfund Site Consent Decree, Exhibit A, Table 3-1

(2) ECC Superfund Site Consent Decree, Exhibit A, Table 4-1

(3) Preliminary additional compounds that are being assessed by U.S. EPA and the Enviro-Chem Trustees for addition to the Consent Decree Table 3-1

TABLE 2-2

**SUPPORT ZONE INVESTIGATION  
SOIL GAS ACTION LEVELS  
ENVIROCHEM SUPERFUND SITE  
ZIONSVILLE, INDIANA**

VOC Compound	Soil Vapor Concentration <sup>(1)</sup> (PPMV)
Acetone	25
Chloroform	50
1,1-Dichloroethane	0.3
1,1-Dihloroethene	52
Ethylbenzene	932
Methylene Chloride	2
Methyl Ethyl Ketone	1 <sup>(2)</sup>
Methyl Isobutyl Ketone	23
Tetrachloroethene	1
Toluene	3,656
1,1,1-Trichloroethane	282
1,1,2-Trichloroethane	1
Trichloroethene	7
Total Xylenes	479
Vinyl Chloride <sup>(3)</sup>	---
1,2-Dichloroethane <sup>(3)</sup>	---
Chloroethane <sup>(3)</sup>	---
1,2-Dichloroethene <sup>(3)</sup>	---
1,2-Dichlorobenzene <sup>(3)</sup>	---

Notes

- (1) Soil vapor concentration calculated as 10 percent of the acceptable soil vapor concentrations (ECC Superfund Site Consent Decree, Exhibit A, Table 4-1) or the detection limit of the field analytical instrumentation, whichever is greater.
- (2) The action level for this compound may be modified based upon field determination of the analytical detection limit.
- (3) Preliminary additional compounds that are being assessed by U.S. EPA and the Enviro-Chem Trustees for addition to the Consent Decree Table 3-1.

**APPENDIX A**

**CERTIFICATES OF ANALYSIS - HAND AUGER INVESTIGATION**

## CERTIFICATE OF ANALYSIS

Service Location	Received 14-OCT-93	Project 2506	Lab ID A293253
HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Complete 03-NOV-93	PO Number .....	
	Printed 03-NOV-93	Sampled .....	
			14-OCT-93 13:25

Report To	BILL To
ROBERT J. AUTO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
<i>Sample Description</i>	
DESCRIPTION: SUPP. ZONE DIVERSION CHANNEL	

Parameter	Result	Det. Limit	Units
ACETONE	BDL	100	ug/kg
ACROLEIN	BDL	250	ug/kg
ACRYLONITRILE	BDL	350	ug/kg
BENZENE	BDL	25	ug/kg
BROMODICHLOROMETHANE	BDL	25	ug/kg
BROMOFORM	BDL	25	ug/kg
BROMOMETHANE	BDL	50	ug/kg
CARBON DISULFIDE	BDL	25	ug/kg
CARBON TETRACHLORIDE	BDL	25	ug/kg
CHLOROBENZENE	BDL	25	ug/kg
CHLOROETHANE	BDL	50	ug/kg
CHLOROFORM	BDL	25	ug/kg
CHLORMETHANE	BDL	50	ug/kg
DIBROMOCHLOROMETHANE	BDL	25	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	25	ug/kg
DICHLORODIFLUOROMETHANE	BDL	25	ug/kg
1,1-DICHLOROETHANE	BDL	25	ug/kg
1,2-DICHLOROETHANE	BDL	25	ug/kg
1,1-DICHLOROETHENE	BDL	25	ug/kg
1,2-DICHLOROPROPANE	BDL	25	ug/kg
ETHYLBENZENE	BDL	25	ug/kg
FLUOROTRICHLOROMETHANE	BDL	25	ug/kg
2-HEXANONE	BDL	50	ug/kg
METHYLENE CHLORIDE	42	25	ug/kg
METHYL ETHYL KETONE	BDL	50	ug/kg
4-METHYL-2-PENTANONE	BDL	50	ug/kg
STYRENE	BDL	25	ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	25	ug/kg
TETRACHLOROETHENE	320	25	ug/kg
TETRAHYDURAM	BDL	120	ug/kg
TOLUENE	75	25	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	25	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	25	ug/kg
1,1,1-TRICHLOROETHANE	710	25	ug/kg
1,1,2-TRICHLOROETHANE	BDL	25	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293253

Parameter	Result	Det. Limit	Units
TRICHLOROETHENE	73	25	ug/kg
VINYL ACETATE	BDL	50	ug/kg
VINYL CHLORIDE	BDL	50	ug/kg
XYLENE (TOTAL)	BDL	25	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	95		% Rec
TOLUENE-D8	104		% Rec
BROMOFLUOROBENZENE	98		% Rec
1:5 DILUTION.			

## Sample Comments

BDL Below Detection Limit

Sample chain of custody number 10936.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:

Page 2 (last page)

L I S T   O F   C O M P L E T E D   T A S K S

GC/MS CLP   GC/MS CLP

Completed 03-NOV-93

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 28-OCT-93	Project 2506	Lab ID A294793
	Complete 08-NOV-93	PO Number .....	
	Printed 09-NOV-93	Sampled	
			19-OCT-93 16:30

Report To	BILL To
ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
Sample Description	
DESCRIPTION: HA-3 (0.5-1.0') LOCATION: ENVIROCHEM - SITE PREP & MATERIAL REMOVAL	

**VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A**

Analyte: G. WILSON      Analysis Date: 01-NOV-93 11:05      Instrument: GC/MS VOC

Test: OS10.9.0

Parameter	Result	Det. Limit	Units
ACETONE	BDL	20	ug/kg
ACROLEIN	BDL	50	ug/kg
ACRYLONITRILE	BDL	70	ug/kg
BENZENE	BDL	5	ug/kg
BROMODICHLOROMETHANE	BDL	5	ug/kg
BROMOFORM	BDL	5	ug/kg
BROMOMETHANE	BDL	10	ug/kg
CARBON DISULFIDE	BDL	5	ug/kg
CARBON TETRACHLORIDE	BDL	5	ug/kg
CHLOROBENZENE	BDL	5	ug/kg
CHLOROETHANE	BDL	10	ug/kg
CHLOROFORM	BDL	5	ug/kg
CHLOROMETHANE	BDL	10	ug/kg
DIBROMOCHLOROMETHANE	BDL	5	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg
1,1-DICHLOROETHANE	BDL	5	ug/kg
1,2-DICHLOROETHANE	BDL	5	ug/kg
1,1-DICHLOROETHENE	BDL	5	ug/kg
1,2-DICHLOROPROPANE	BDL	5	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg
2-HEXANONE	BDL	10	ug/kg
METHYLENE CHLORIDE	8	5	ug/kg
METHYL ETHYL KETONE	BDL	10	ug/kg
4-METHYL-2-PENTANONE	BDL	10	ug/kg
STYRENE	BDL	5	ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg
TETRACHLOROETHENE	BDL	5	ug/kg
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	20	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	74	5	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A294793

Parameter	Result	Det. Limit	Units
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	21	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	111		% Rec
TOLUENE-D8	98		% Rec
BROMOFLUOROBENZENE	103		% Rec

Sample reanalyzed with no improvement in internal standard areas.

## Sample Comments

*BDL Below Detection Limit*

*Sample chain of custody number 13243.*

*This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.*

*Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872*

Quality Assurance Officer:

Page 2 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 29-OCT-93	Project 2506	Lab ID A295096
	Complete 11-NOV-93	PO Number 9311001-RJA	
	Printed 11-NOV-93	Sampled	
			29-OCT-93 14:25

Report To

ROBERT J. AUTIO  
QUALITY ENVIRONMENTAL MANAGEMENT  
1640 STRICKLAND  
MARTINSVILLE, IN 46151

Bill To

CHARLES JACKSON  
QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555  
ROCKVILLE, IN 47872

**Sample Description**

DESCRIPTION: HA-16 (1.5-2.0')

**VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A**

Analyst: G. WILSON

Analysis Date: 04-NOV-93 06:10 Instrument: GC/MS VOA

Test: 0510.9.0

Parameter	Result	Det. Limit	Units
ACETONE	BDL	20	ug/kg
ACROLEIN	BDL	50	ug/kg
ACRYLONITRILE	BDL	70	ug/kg
BENZENE	BDL	5	ug/kg
BROMODICHLOROMETHANE	BDL	5	ug/kg
BROMOFORM	BDL	5	ug/kg
BROMOMETHANE	BDL	10	ug/kg
CARBON DISULFIDE	BDL	5	ug/kg
CARBON TETRACHLORIDE	BDL	5	ug/kg
CHLOROBENZENE	BDL	5	ug/kg
CHLOROETHANE	BDL	10	ug/kg
CHLOROFORM	BDL	5	ug/kg
CHLOROMETHANE	BDL	10	ug/kg
DIBROMOCHLOROMETHANE	BDL	5	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg
1,1-DICHLOROETHANE	BDL	5	ug/kg
1,2-DICHLOROETHANE	BDL	5	ug/kg
1,1-DICHLOROETHENE	BDL	5	ug/kg
1,2-DICHLOROPROPANE	BDL	5	ug/kg
ETHYLBENZENE	BDL	5	ug/kg
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg
2-HEXANONE	BDL	10	ug/kg
METHYLENE CHLORIDE	5	5	ug/kg
METHYL ETHYL KETONE	BDL	10	ug/kg
4-METHYL-2-PENTANONE	BDL	10	ug/kg
STYRENE	BDL	5	ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg
TETRACHLOROETHENE	BDL	5	ug/kg
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	6	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	11	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A295096

Parameter	Result	Det. Limit	Units
TRICHLOROETHENE	7	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	94		% Rec
TOLUENE-D8	103		% Rec
BROMOFLUOROBENZENE	92		% Rec

## Sample Comments

BDL Below Detection Limit

Sample chain of custody number 14434.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 2 (last page)

HERITAGE LABORATORIES, INC.

Lab Sample ID: A295096

L I S T   O F   C O M P L E T E D   T A S K S

GC/MS CLP   GC/MS CLP

Completed 11-NOV-93

**APPENDIX B**

**CERTIFICATES OF ANALYSIS - DECONTAMINATION PAD  
AND WASTEWATER STORAGE PAD INVESTIGATION**

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 21-OCT-93	Project 2506	Lab ID A293855
	Complete 12-NOV-93	PO Number 9311001-RJA	
	Printed 12-NOV-93	Sampled	
			18-OCT-93 12:50

Report To	BILL TO
ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
Sample Description	
SAMPLE ID: WWP-SUMP DESCRIPTION: WASTEWATER STORAGE PAD	

TOTAL SOLIDS EPA 160.3		Test: G401.7.0	
Analyst: B. PRIDMORE	Analysis Date: 22-OCT-93		
Parameter	Result	Det. Limit	Units
SOLIDS	81	0.001	Percent

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A		Test: G510.9.0	
Analyst: G. WILSON	Analysis Date: 25-OCT-93 14:25	Instruments: GC/MS VOA	
Parameter	Result	Det. Limit	Units
ACETONE	75	20	ug/kg
ACROLEIN	BDL	50	ug/kg
ACRYLONITRILE	BDL	70	ug/kg
BENZENE	6	5	ug/kg
BROMODICHLOROMETHANE	BDL	5	ug/kg
BROMOFORM	BDL	5	ug/kg
BROMOMETHANE	BDL	10	ug/kg
CARBON DISULFIDE	BDL	5	ug/kg
CARBON TETRACHLORIDE	BDL	5	ug/kg
CHLOROBENZENE	BDL	5	ug/kg
CHLOROETHANE	32	10	ug/kg
CHLOROFORM	BDL	5	ug/kg
CHLOROMETHANE	BDL	10	ug/kg
DIBROMOCHLOROMETHANE	BDL	5	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg
1,1-DICHLOROETHANE	15	5	ug/kg
1,2-DICHLOROETHANE	BDL	5	ug/kg
1,1-DICHLOROETHENE	BDL	5	ug/kg
1,2-DICHLOROPROPANE	BDL	5	ug/kg
ETHYLBENZENE	EST 290	5	ug/kg
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg
2-HEXANONE	BDL	10	ug/kg
METHYLENE CHLORIDE	7	5	ug/kg
4-ETHYL ETHYL KETONE	BDL	10	ug/kg
4-METHYL-2-PENTANONE	BDL	10	ug/kg
STYRENE	BDL	5	ug/kg
,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg
TETRACHLOROETHENE	BDL	5	ug/kg

Parameter	Result	Det. Limit	Units
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	25	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	34	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	6	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	100	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	113		% Rec
TOLUENE-D8	108		% Rec
BROMOFLUOROBENZENE	95		% Rec

Dilution necessary due to high concentration of target compounds.

#### VOLATILE ORGANICS (HEATED PURGE & TRAP) SH846-8240A

Analyst: G. WILSON      Analysis Date: 27-OCT-93 06:19      Instrument: GC/MS VOA

Test: 0510.9.1

Parameter	Result	Det. Limit	Units
ACETONE	BDL	100	ug/kg
ACROLEIN	BDL	250	ug/kg
ACRYLONITRILE	BDL	350	ug/kg
BENZENE	BDL	25	ug/kg
BROMODICHLOROMETHANE	BDL	25	ug/kg
BROMOFORM	BDL	25	ug/kg
BROMOMETHANE	BDL	50	ug/kg
CARBON DISULFIDE	BDL	25	ug/kg
CARBON TETRACHLORIDE	BDL	25	ug/kg
CHLOROBENZENE	BDL	25	ug/kg
CHLOROETHANE	BDL	50	ug/kg
CHLOROFORM	BDL	25	ug/kg
CHLOROMETHANE	BDL	50	ug/kg
DIBROMOCHLOROMETHANE	BDL	25	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	25	ug/kg
DICHLORODIFLUOROMETHANE	BDL	25	ug/kg
1,1-DICHLOROETHANE	BDL	25	ug/kg
1,2-DICHLOROETHANE	BDL	25	ug/kg
1,1-DICHLOROETHENE	BDL	25	ug/kg
1,2-DICHLOROPROPANE	BDL	25	ug/kg
ETHYL BENZENE	330	25	ug/kg
TRICHLOROFLUOROMETHANE	BDL	25	ug/kg
2-HEXANONE	BDL	50	ug/kg
DICHLOROMETHANE (METHYLENE CHLORIDE)	BDL	25	ug/kg
METHYL ETHYL KETONE	BDL	50	ug/kg
4-METHYL-2-PENTANONE	BDL	50	ug/kg
STYRENE	BDL	25	ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	25	ug/kg
TETRACHLOROETHENE	BDL	25	ug/kg
TETRAHYDROFURAN	BDL	120	ug/kg
TOLUENE	BDL	25	ug/kg
1,2-DICHLOROETHENE (CIS AND TRANS)	BDL	25	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	25	ug/kg
1,1,1-TRICHLOROETHANE	BDL	25	ug/kg
1,1,2-TRICHLOROETHANE	BDL	25	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293855

Parameter	Result	Det. Limit	Units
TRICHLOROETHENE	BDL	25	ug/kg
VINYL ACETATE	BDL	50	ug/kg
VINYL CHLORIDE	BDL	50	ug/kg
XYLENES (O/M/P-XYLENE)	360	25	ug/kg
...			
SURROGATE RECOVERY			
DICHLOROETHANE-D4	99		% Rec
TOLUENE-D8	97		% Rec
4-BROMOFLUOROBENZENE	101		% Rec
1:5 DILUTION.			

## GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550

Analyst: C. KING

Analysis Date: 25-OCT-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	1.0		ml

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: J. MINNIEAR, II

Analysis Date: 26-OCT-93 23:34 Instrument: GC/MS SYOA

Test: 0505.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHTHALATE	BDL	330	ug/kg
BIS(2-CHLOROETHOXY)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLOROISOPROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENYLETHER	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLOROANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENYLETHER	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	EST 180	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg
DIETHYLPHthalate	BDL	330	ug/kg
DIMETHYLPHthalate	BDL	330	ug/kg
DI-N-BUTYLPHthalate	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalate	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg

Parameter	Result	Det. Limit	Units
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXAChLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	56		% Rec
PHENOL-D5	59		% Rec
NITROBENZENE-D5	67		% Rec
2-FLUOROBIPHENYL	71		% Rec
2,4,6-TRIBROMOPHENOL	57		% Rec
TERPHENYL-D14	71		% Rec

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS      Analysis Date: 29-OCT-93      Instrument: GC/ECD  
 Prep: GC & GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Test: 0305.1.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293855

Parameter	Result	Det. Limit	Units
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	92.6		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. HANN

Analysis Date: 25-OCT-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		ml

## BARIUM ICP SW846-6010A

Analyst: M. JAO

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M104.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	40.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: M. JAO

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M105.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMUM	BDL	0.50	mg/kg

## CHROMIUM ICP SW846-6010A

Analyst: M. JAO

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M110.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CHROMIUM	11.	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: M. JAO

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M116.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
LEAD	9.0	5.0	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293855

## SILVER ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: GFAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. CAROWELL      Analysis Date: 25-OCT-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. HAHN      Analysis Date: 05-NOV-93

Test: P130.7.1

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## ARSENIC GFAA SW846-7060

Analyst: W. WATNESS      Analysis Date: 08-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.1

Test: M103.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	2.7	1.0	mg/kg
1:2 DILUTION			

## SELENIUM GFAA SW846-7740

Analyst: W. WATNESS      Analysis Date: 03-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.50	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: J. WALLACE      Analysis Date: 01-NOV-93

Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. KAPP      Analysis Date: 03-NOV-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M129.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.050	mg/kg

## Sample Comments

BDL Below Detection Limit  
 EST Estimated Value

Sample chain of custody number 14431.

This Certificate shall not be reproduced, except in full,  
 without the written approval of the lab.

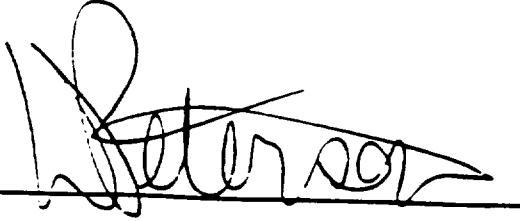
Additional copies of this report sent to:  
 CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
 DR 1, BOX 555, ROCKVILLE, IN 47872

HERITAGE LABORATORIES, INC.

Lab Sample ID: A293855

Sample Comments

Quality Assurance Officer:

A handwritten signature in black ink, appearing to read "Peterson". The signature is written over a horizontal line that extends from the "Q" in "Quality Assurance Officer" and ends under the "R" in "Peterson".

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 21-OCT-93	Project 2506	Lab ID A293856
	Complete 12-NOV-93	PO Number 9311001-RJA	
	Printed 12-NOV-93	Sampled	
			21-OCT-93 13:40

Report To	Bill To
ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
<b>Sample Description</b>	
SAMPLE ID: WWP-3 DESCRIPTION: WASTEWATER STORAGE PAD	

TOTAL SOLIDS EPA 160.3		Test: G601.7.0
Analyst: B. PRIDEMORE	Analysis Date: 22-OCT-93	
SOLIDS	Parameter Result 89	Det. Limit 0.001 Units Percent

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A		Test: G510.9.0
Analyst: G. WILSON	Analysis Date: 03-NOV-93 07:09	Instrument: GC/MS VOA
Parameter	Result	Det. Limit
ACETONE	BDL	20 ug/kg
ACROLEIN	BDL	50 ug/kg
ACRYLONITRILE	BDL	70 ug/kg
BENZENE	BDL	5 ug/kg
BROMODICHLOROMETHANE	BDL	5 ug/kg
BROMOFORM	BDL	5 ug/kg
BROMOMETHANE	BDL	10 ug/kg
CARBON DISULFIDE	BDL	5 ug/kg
CARBON TETRACHLORIDE	BDL	5 ug/kg
CHLOROBENZENE	BDL	5 ug/kg
CHLOROETHANE	BDL	10 ug/kg
CHLOROFORM	BDL	5 ug/kg
CHLOROMETHANE	BDL	10 ug/kg
DIBROMOCHLOROMETHANE	BDL	5 ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5 ug/kg
DICHLORODIFLUOROMETHANE	BDL	5 ug/kg
1,1-DICHLOROETHANE	BDL	5 ug/kg
1,2-DICHLOROETHANE	BDL	5 ug/kg
1,1-DICHLOROETHENE	BDL	5 ug/kg
1,2-DICHLOROPROPANE	BDL	5 ug/kg
ETHYLBENZENE	BDL	5 ug/kg
FLUOROTRICHLOROMETHANE	BDL	5 ug/kg
2-HEXANONE	BDL	10 ug/kg
METHYLENE CHLORIDE	11	5 ug/kg
METHYL ETHYL KETONE	BDL	10 ug/kg
4-METHYL-2-PENTANONE	BDL	10 ug/kg
STYRENE	BDL	5 ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	5 ug/kg
TETRACHLOROETHENE	BDL	5 ug/kg

Parameter	Result	Det. Limit	Units
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	16	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	73	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	32	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	102		% Rec
TOLUENE-D8	104		% Rec
BROMOFLUOROBENZENE	100		% Rec

## GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550

Analyst: C. KING

Analysis Date: 25-OCT-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	1.0		ml

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: J. MINNIEAR, II

Analysis Date: 27-OCT-93 00:26 Instrument: GC/MS SVOA

Test: 0503.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHoxy)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLORoisopropyl)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHthalate	BDL	330	ug/kg
1-BROMOPHENYLPHENylether	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLORoANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
1-CHLOROPHENYLPHENylether	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DiBenz(A,H)ANTHRACENE	BDL	330	ug/kg
IBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
,4-DICHLOROBENZENE	BDL	330	ug/kg
,3'-DICHLOROBENZIDINE	BDL	660	ug/kg
DiETHYLPHthalate	BDL	330	ug/kg
MIMETHYLPHthalate	BDL	330	ug/kg
I-N-BUTYLPHthalate	BDL	330	ug/kg
UNITROBENZENES	BDL	1600	ug/kg

Parameter	Result	Det. Limit	Units
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
OI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	55		% Rec
PHENOL-D5	58		% Rec
NITROBENZENE-D5	74		% Rec
2-FLUOROBIPHENYL	72		% Rec
2,4,6-TRIBROMOPHENOL	49		% Rec
TERPHENYL-D14	84		% Rec

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293856

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS

Analysis Date: 29-OCT-93

Instrument: GC/ECD

Test: 0305.1.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	79.2		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. HANN

Analysis Date: 25-OCT-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		ml

## BARIUM ICP SW846-6010A

Analyst: N. JAO

Analysis Date: 27-OCT-93 11:00

Instrument: ICP

Test: M104.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	40.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: N. JAO

Analysis Date: 27-OCT-93 11:00

Instrument: ICP

Test: M108.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMUM	BDL	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293856

## CHROMIUM ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	8.9	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M116.3.0

Parameter	Result	Det. Limit	Units
LEAD	8.8	5.0	mg/kg

## SILVER ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. CARDWELL      Analysis Date: 25-OCT-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		ml

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. NAHM      Analysis Date: 05-NOV-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		ml

## ARSENIC GFAA SW846-7060

Analyst: W. WATNESS      Analysis Date: 08-NOV-93      Instruments: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M103.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	4.6	2.0	mg/kg

1:4 DILUTION

## SELENIUM GFAA SW846-7740

Analyst: W. WATNESS      Analysis Date: 05-NOV-93      Instruments: GFAA

Test: M128.2.0

Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.50	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: J. WALLACE      Analysis Date: 01-NOV-93

Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		ml

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. HAPP      Analysis Date: 01-NOV-93      Instruments: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.050	mg/kg

BDL Below Detection Limit

## Sample Comments

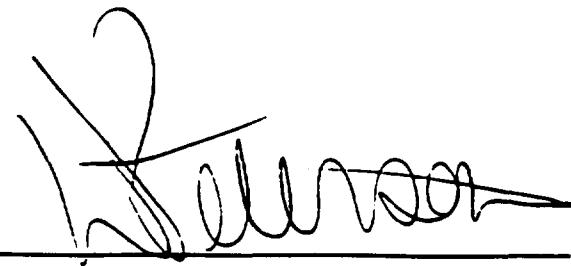
Sample chain of custody number 14431.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:

CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 6 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 21-OCT-93	Project 2506	Lab ID A293858
	Complete 12-NOV-93	PO Number 9311001-RJA	
	Printed 12-NOV-93	Sampled	
			21-OCT-93 14:10

Report To	Bill To
ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
<b>Sample Description</b>	
SAMPLE ID: WWP-18 DESCRIPTION: WASTEWATER STORAGE PAD	

<b>TOTAL SOLIDS EPA 160.3</b>		Test: G601.7.0
Analyst: B. PRIDEMORE	Analysis Date: 22-OCT-93	
Parameter	Result	Det. Limit
SOLIDS	86	0.001

<b>VOLATILE ORGANICS (HEATED PURGE &amp; TRAP) SW846-8240A</b>		Test: G510.9.0
Analyst: G. WILSON	Analysis Date: 03-NOV-93 04:40	Instrument: GC/MS VOA
Parameter	Result	Det. Limit
ACETONE	BDL	20
ACROLEIN	BDL	50
ACRYLONITRILE	BDL	70
BENZENE	BDL	5
BROMODICHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
BROMOMETHANE	BDL	10
CARBON DISULFIDE	BDL	5
CARBON TETRACHLORIDE	BDL	5
CHLOROBENZENE	BDL	5
CHLOROETHANE	BDL	10
CHLOROFORM	BDL	5
CHLOROMETHANE	BDL	10
DIBROMOCHLOROMETHANE	BDL	5
CIS-1,3-DICHLOROPROPENE	BDL	5
DICHLORODIFLUOROMETHANE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1-DICHLOROETHENE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
ETHYLBENZENE	BDL	5
FLUOROTRICHLOROMETHANE	BDL	5
2-HEXANONE	BDL	10
METHYLENE CHLORIDE	7	5
METHYL ETHYL KETONE	BDL	10
4-METHYL-2-PENTANONE	BDL	10
STYRENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5
TETRACHLOROETHENE	BDL	5

Parameter	Result	Det. Limit	Units
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	BDL	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	27	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	7	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	98		% Rec
TOLUENE-D8	106		% Rec
BROMOFLUOROBENZENE	101		% Rec

## GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550

Analyst: C. KING

Analysis Date: 25-OCT-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	1.0		mL

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: J. MINNIEAR, II

Analysis Date: 27-OCT-93 01:19 Instrument: GC/MS SVOA

Test: 0505.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHOXY)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLOROISOPROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENYLETHER	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLOROANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENYLETHER	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg
DIETHYLPHthalate	BDL	330	ug/kg
DIMETHYLPHthalate	BDL	330	ug/kg
DI-N-BUTYLPHthalate	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg

Parameter	Result	Det. Limit	Units
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
OI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
<b>SURROGATE RECOVERY</b>			
2-FLUOROPHENOL	49		% Rec
PHENOL-D5	50		% Rec
NITROBENZENE-D5	67		% Rec
2-FLUOROBIPHENYL	62		% Rec
2,4,6-TRIBROMOPHENOL	38		% Rec
TERPHENYL-D14	68		% Rec

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293858

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS

Analysis Date: 29-OCT-93 Instrument: GC/ECD

Test: Q305.1.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	81.6		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. RAHN

Analysis Date: 25-OCT-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		
FINAL WEIGHT OR VOLUME	100		Grams ml

## BARIUM ICP SW846-6010A

Analyst: M. JAO

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M106.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	46.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: M. JAO

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M106.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMIUM	BDL	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293858

## CHROMIUM ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0      Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	9.7	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0      Test: M116.3.0

Parameter	Result	Det. Limit	Units
LEAD	12.	5.0	mg/kg

## SILVER ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0      Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. CARDWELL      Analysis Date: 25-OCT-93      Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. MAHM      Analysis Date: 05-NOV-93      Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## ARSENIC GFAA SW846-7060

Analyst: W. WATNESS      Analysis Date: 08-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0      Test: M103.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	4.4	2.0	mg/kg

1:4 DILUTION

## SELENIUM GFAA SW846-7740

Analyst: W. WATNESS      Analysis Date: 05-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0      Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.50	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: J. WALLACE      Analysis Date: 01-NOV-93      Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. HAPP      Analysis Date: 03-NOV-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0      Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.050	mg/kg

- HERITAGE LABORATORIES, INC.

Lab Sample ID: A293858

BDL Below Detection Limit

Sample Comments

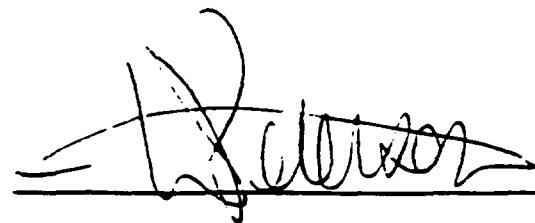
Sample chain of custody number 14431.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:

CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 6 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 21-OCT-93	Project 2506	Lab ID A293859
	Complete 12-NOV-93	PO Number 9311001-RJA	
	Printed 12-NOV-93	Sampled	
			21-OCT-93 14:35

Report To  ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	BILL TO  CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
<b>Sample Description</b>	
SAMPLE ID: WWP-19 DESCRIPTION: WASTEWATER STORAGE PAD	

TOTAL SOLIDS EPA 160.3		Test: G401.7.0	
Analyst: B. PRIDMORE			
Parameter	Result	Det. Limit	Units
SOLIDS	81	0.001	Percent

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A		Test: G510.9.0	
Analyst: G. WILSON		Instrument: GC/MS VOA	
Parameter	Result	Det. Limit	Units
ACETONE	65	20	ug/kg
ACROLEIN	BDL	50	ug/kg
ACRYLONITRILE	BDL	70	ug/kg
BENZENE	BDL	5	ug/kg
BROMODICHLOROMETHANE	BDL	5	ug/kg
BROMOFORM	BDL	5	ug/kg
BROMOMETHANE	BDL	10	ug/kg
CARBON DISULFIDE	BDL	5	ug/kg
CARBON TETRACHLORIDE	BDL	5	ug/kg
CHLOROBENZENE	BDL	5	ug/kg
CHLOROETHANE	BDL	10	ug/kg
CHLOROFORM	BDL	5	ug/kg
CHLOROMETHANE	BDL	10	ug/kg
DIBROMOCHLOROMETHANE	BDL	5	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg
1,1-DICHLOROETHANE	BDL	5	ug/kg
1,2-DICHLOROETHANE	BDL	5	ug/kg
1,1-DICHLOROETHENE	BDL	5	ug/kg
1,2-DICHLOROPROPANE	BDL	5	ug/kg
ETHYLBENZENE	BDL	5	ug/kg
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg
2-HEXANONE	BDL	10	ug/kg
METHYLENE CHLORIDE	8	5	ug/kg
METHYL ETHYL KETONE	BDL	10	ug/kg
4-METHYL-2-PENTANONE	BDL	10	ug/kg
STYRENE	BDL	5	ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg
TETRACHLOROETHENE	BDL	5	ug/kg

Parameter	Result	Det. Limit	Units
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	10	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	28	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	10	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	103		% Rec
TOLUENE-D8	105		% Rec
BROMOFLUOROBENZENE	104		% Rec

**GC & GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550**

Analyst: C. KING

Analysis Date: 25-OCT-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	1.0		mL

**SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A**

Analyst: G. HUGHES

Analysis Date: 28-OCT-93 12:12 Instrument: GC/MS SVOA

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Test: 0505.3.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHoxy)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLORoisopropyl)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENylether	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLORoANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENylether	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg
DIETHYLPHthalate	BDL	330	ug/kg
DIMETHYLPHthalate	BDL	330	ug/kg
DI-N-BUTYLPHthalate	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg

Parameter	Result	Det. Limit	Units
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	80		% Rec
PHENOL-D5	72		% Rec
NITROBENZENE-D5	66		% Rec
2-FLUOROBIPHENYL	69		% Rec
2,4,6-TRIBROMOPHENOL	64		% Rec
TERPHENYL-D14	74		% Rec

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293859

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS

Analysis Date: 29-OCT-93 Instrument: GC/ECD

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Test: Q305.1.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	91		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. HANN

Analysis Date: 25-OCT-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		ml

## BARIUM ICP SW846-6010A

Analyst: M. JAC

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M106.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	76.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: M. JAC

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M106.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMIUM	BDL	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293859

## CHROMIUM ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	16.	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M116.3.0

Parameter	Result	Det. Limit	Units
LEAD	12.	5.0	mg/kg

## SILVER ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. CARDWELL      Analysis Date: 25-OCT-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. HAHN      Analysis Date: 05-NOV-93

Test: P130.7.1

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## ARSENIC GFAA SW846-7060

Analyst: W. WATNESS      Analysis Date: 08-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.1

Test: M103.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	5.8	2.0	mg/kg
<i>1:4 DILUTION</i>			

## SELENIUM GFAA SW846-7740

Analyst: W. WATNESS      Analysis Date: 05-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.50	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: J. WALLACE      Analysis Date: 01-NOV-93

Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. NAPP      Analysis Date: 03-NOV-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.050	mg/kg

HERITAGE LABORATORIES, INC.

Lab Sample ID: A293859

BDL Below Detection Limit

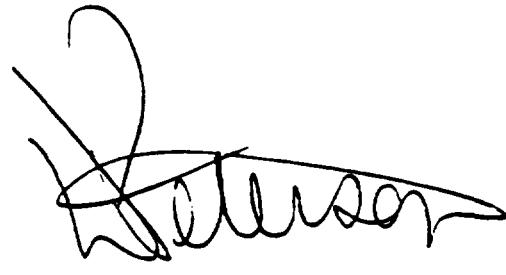
Sample Comments

Sample chain of custody number 14431.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:

A handwritten signature in black ink, appearing to read "Charles Jackson". The signature is somewhat stylized and cursive.

Page 6 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 21-OCT-93	Project 2506	Lab ID A293860
	Complete 18-NOV-93	PO Number 9311001-RJA	
	Printed 18-NOV-93	Sampled	
			21-OCT-93 14:55

Report To

Bill To

ROBERT J. AUTIO  
QUALITY ENVIRONMENTAL MANAGEMENT  
1640 STRICKLAND  
MARTINSVILLE, IN 46151

CHARLES JACKSON  
QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555  
ROCKVILLE, IN 47872

Sample Description

SAMPLE ID: WWP-22  
DESCRIPTION: WASTEWATER STORAGE PAD

**TOTAL SOLIDS EPA 160.3**

Analyst: B. PRIDMORE

Analysis Date: 22-OCT-93

Test: G401.7.0

Parameter	Result	Det. Limit	Units
SOLIDS	88	0.001	Percent

**VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A**

Analyst: G. WILSON

Analysis Date: 04-NOV-93 05:22 Instrument: GC/MS VOA

Test: OS10.9.0

Parameter	Result	Det. Limit	Units
ACETONE	BDL	20	ug/kg
ACROLEIN	BDL	50	ug/kg
ACRYLONITRILE	BDL	70	ug/kg
BENZENE	BDL	5	ug/kg
BROMODICHLOROMETHANE	BDL	5	ug/kg
BROMOFORM	BDL	5	ug/kg
BROMOMETHANE	BDL	10	ug/kg
CARBON DISULFIDE	BDL	5	ug/kg
CARBON TETRACHLORIDE	BDL	5	ug/kg
CHLOROBENZENE	BDL	5	ug/kg
CHLOROETHANE	BDL	10	ug/kg
CHLOROFORM	BDL	5	ug/kg
CHLOROMETHANE	BDL	10	ug/kg
DIBROMOCHLOROMETHANE	BDL	5	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg
1,1-DICHLOROETHANE	BDL	5	ug/kg
1,2-DICHLOROETHANE	BDL	5	ug/kg
1,1-DICHLOROETHENE	BDL	5	ug/kg
1,2-DICHLOROPROPANE	BDL	5	ug/kg
ETHYL BENZENE	BDL	5	ug/kg
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg
2-HEXANONE	BDL	10	ug/kg
METHYLENE CHLORIDE	BDL	5	ug/kg
METHYL ETHYL KETONE	BDL	10	ug/kg
4-METHYL-2-PENTANONE	BDL	10	ug/kg
STYRENE	BDL	5	ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg
TETRACHLOROETHENE	BDL	5	ug/kg

Parameter	Result	Det. Limit	Units
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	6	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	28	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	9	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	93		% Rec
TOLUENE-D8	106		% Rec
BROMOFLUOROBENZENE	103		% Rec

**GC & GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550**

Analyst: C. KING

Analysis Date: 25-OCT-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	1.0		mL

**SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A**

Analyst: J. MINNIEAR, II

Analysis Date: 27-OCT-93 03:04 Instrument: GC/MS SVOA

Test: 0505.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHOXY)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLOROISOPROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENYLETHER	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLORANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENYLETHER	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg
DIETHYLPHthalate	BDL	330	ug/kg
DIMETHYLPHthalate	BDL	330	ug/kg
DI-N-BUTYLPHthalate	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg

Parameter	Result	Det. Limit	Units
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	56		% Rec
PHENOL-D5	57		% Rec
NITROBENZENE-D5	74		% Rec
2-FLUOROBIPHENYL	66		% Rec
2,4,6-TRIBROMOPHENOL	41		% Rec
TERPHENYL-D14	76		% Rec

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS

Analysis Date: 29-OCT-93

Instrument: GC/ECD

Test: 0305.1.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	82.6		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. HAHN

Analysis Date: 25-OCT-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		
FINAL WEIGHT OR VOLUME	100		Grams ml

## BARIUM ICP SW846-6010A

Analyst: N. JAO

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M104.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	37.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: N. JAO

Analysis Date: 27-OCT-93 11:00 Instrument: ICP

Test: M105.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMIUM	BDL	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293860

## CHROMIUM ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	7.8	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M118.3.0

Parameter	Result	Det. Limit	Units
LEAD	8.2	5.0	mg/kg

## SILVER ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 27-OCT-93 11:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. CARDWELL      Analysis Date: 25-OCT-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		
FINAL WEIGHT OR VOLUME	100		Grams ml

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. HANN      Analysis Date: 05-NOV-93

Test: P130.7.1

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		
FINAL WEIGHT OR VOLUME	100		Grams ml

## ARSENIC GFAA SW846-7060

Analyst: V. WATNESS      Analysis Date: 08-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M105.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	4.8	2.0	mg/kg
<i>1:4 DILUTION</i>			

## SELENIUM GFAA SW846-7740

Analyst: V. WATNESS      Analysis Date: 05-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.50	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: J. WALLACE      Analysis Date: 02-NOV-93

Test: P132.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		
FINAL VOLUME	100		Grams ml

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. HAPP      Analysis Date: 03-NOV-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.050	mg/kg

**BDL Below Detection Limit**

## Sample Comments

Sample chain of custody number 14431.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 6 (last page)

## LIST OF COMPLETED TASKS

GC/MS CLP	GC/MS CLP	Completed 12-NOV-93
GC CLP	GC CLP	Completed 04-NOV-93
MTO CLP	METALS CLP REPORT PACKAGE	Completed 10-NOV-93

## CERTIFICATE OF ANALYSIS

Service Location	Received 21-OCT-93	Project 2506	Lab ID A293865
HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Complete 12-NOV-93	PO Number 9311001-RJA	
	Printed 18-NOV-93	Sampled	
			21-OCT-93 15:25

Report To

ROBERT J. AUTIO  
 QUALITY ENVIRONMENTAL MANAGEMENT  
 1640 STRICKLAND  
 MARTINSVILLE, IN 46151

Bill To

CHARLES JACKSON  
 QUALITY ENVIRONMENTAL MANAGEMENT  
 RR 1, BOX 555  
 ROCKVILLE, IN 47872

## Sample Description

SAMPLE ID: EQUIP BLANK  
 DESCRIPTION: DI WATER

## VOLATILE ORGANICS SW846-8240A

Analyst: R. SHAMP

Analysis Date: 27-OCT-93 16:53 Instrument: GC/MS VOA

Test: 0510.3.C

Parameter	Result	Det. Limit	Units
ACETONE	BDL	20	ug/L
ACROLEIN	BDL	50	ug/L
ACRYLONITRILE	BDL	70	ug/L
BENZENE	BDL	5	ug/L
BROMODICHLOROMETHANE	BDL	5	ug/L
BROMOFORM	BDL	5	ug/L
BROMOMETHANE	BDL	10	ug/L
CARBON DISULFIDE	BDL	5	ug/L
CARBON TETRACHLORIDE	BDL	5	ug/L
CHLOROBENZENE	BDL	5	ug/L
CHLOROETHANE	BDL	10	ug/L
CHLOROFORM	BDL	5	ug/L
CHLOROMETHANE	BDL	10	ug/L
DIBROMOCHLOROMETHANE	BDL	5	ug/L
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/L
DICHLORODIFLUOROMETHANE	BDL	5	ug/L
1,1-DICHLOROETHANE	BDL	5	ug/L
1,2-DICHLOROETHANE	BDL	5	ug/L
1,1-DICHLOROETHENE	BDL	5	ug/L
1,2-DICHLOROPROPANE	BDL	5	ug/L
ETHYL BENZENE	BDL	5	ug/L
TRICHLOROFLUOROMETHANE	BDL	5	ug/L
2-HEXANONE	BDL	10	ug/L
DICHLOROMETHANE (METHYLENE CHLORIDE)	BDL	5	ug/L
METHYL ETHYL KETONE	BDL	10	ug/L
4-METHYL-2-PENTANONE	BDL	10	ug/L
STYRENE	BDL	5	ug/L
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/L
TETRACHLOROETHENE	BDL	5	ug/L
TETRAHYDROFURAN	BDL	25	ug/L
TOLUENE	BDL	5	ug/L
1,2-DICHLOROETHENE (CIS AND TRANS)	BDL	5	ug/L
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/L
1,1,1-TRICHLOROETHANE	BDL	5	ug/L

Page 1 (continued on next page)

Parameter	Result	Det. Limit	Units
1,1,2-TRICHLOROETHANE	BDL	5	ug/L
TRICHLOROETHENE	BDL	5	ug/L
VINYL ACETATE	BDL	10	ug/L
VINYL CHLORIDE	BDL	10	ug/L
XYLENES (O/M/P-XYLENE)	BDL	5	ug/L
SURROGATE RECOVERY			
DICHLOROETHANE-D4	97		% Rec
TOLUENE-D8	100		% Rec
4-BROMOFLUOROBENZENE	98		% Rec
<i>In this instrument, packed column has been replaced by capillary column with 8240 criteria.</i>			

## GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW846-3510A

Analyst: M. FRANK

Analysis Date: 26-OCT-93

Test: P233.4.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1000		mL
FINAL VOLUME	1.0		mL

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: G. HUGHS

Analysis Date: 27-OCT-93 15:15 Instrument: GC/MS SVOA

Test: 0505.3.0

Prep: GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW846-3510A P233.4.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	10	ug/L
ACENAPHTHYLENE	BDL	10	ug/L
ANTHRACENE	BDL	10	ug/L
BENZ(A)ANTHRACENE	BDL	10	ug/L
BENZO(A)PYRENE	BDL	10	ug/L
BENZO(B)FLUORANTHENE	BDL	10	ug/L
BENZO(G,H,I)PERYLENE	BDL	10	ug/L
BENZO(K)FLUORANTHENE	BDL	10	ug/L
BENZYL ALCOHOL	BDL	10	ug/L
BENZYLBUTYLPHthalate	BDL	10	ug/L
BIS(2-CHLOROETHoxy)METHANE	BDL	10	ug/L
JIS(2-CHLOROETHYL)ETHER	BDL	10	ug/L
BIS(2-CHLOROISOPROPYL)ETHER	BDL	10	ug/L
BIS(2-ETHYLHEXYL)PHthalate	BDL	10	ug/L
1-BROMOPHENYLPHENylether	BDL	10	ug/L
CARBAZOLE	BDL	10	ug/L
4-CHLORoANILINE	BDL	10	ug/L
1-CHLORoNAPHTHALENE	BDL	10	ug/L
1-CHLOROPHENYLPHENylether	BDL	10	ug/L
CHRySENE	BDL	10	ug/L
1) BENZ(A,H)ANTHRACENE	BDL	10	ug/L
1) BENZOFURAN	BDL	10	ug/L
1,2-DICHLOROBENZENE	BDL	10	ug/L
,3-DICHLOROBENZENE	BDL	10	ug/L
,4-DICHLOROBENZENE	BDL	10	ug/L
5,3'-DICHLOROBENZIDINE	BDL	20	ug/L
DIETHYLPHthalate	BDL	10	ug/L
IMETHYLPHthalate	BDL	10	ug/L
JI-N-BUTYLPHthalate	BDL	10	ug/L
DINITROBENZENES	BDL	50	ug/L
,4-DINITROToluene	BDL	10	ug/L
,6-DINITROToluene	BDL	10	ug/L

## HERITAGE LABORATORIES, INC.

Lat Sample ID: A293865

Parameter	Result	Det. Limit	Units
DI-N-OCTYLPHthalATE	BDL	10	ug/L
FLUORANTHENE	BDL	10	ug/L
FLUORENE	BDL	10	ug/L
HEXACHLOROBENZENE	BDL	10	ug/L
HEXACHLOROBUTADIENE	BDL	10	ug/L
HEXACHLOROCYCLOPENTADIENE	BDL	10	ug/L
HEXACHLOROETHANE	BDL	10	ug/L
INDENO(1,2,3-CD)PYRENE	BDL	10	ug/L
ISOPHORONE	BDL	10	ug/L
2-METHYLNAPHTHALENE	BDL	10	ug/L
NAPHTHALENE	BDL	10	ug/L
2-NITROANILINE	BDL	50	ug/L
3-NITROANILINE	BDL	50	ug/L
4-NITROANILINE	BDL	50	ug/L
NITROBENZENE	BDL	10	ug/L
M-NITROSO-DIPHENYLAMINE	BDL	10	ug/L
N-NITROSO-DI-N-PROPYLAMINE	BDL	10	ug/L
PHENANTHRENE	BDL	10	ug/L
2-PICOLINE	BDL	50	ug/L
PYRENE	BDL	10	ug/L
PYRIDINE	BDL	50	ug/L
TETRACHLOROBENZENES	BDL	10	ug/L
TOLUENEDIAMINE	BDL	50	ug/L
1,2,4-TRICHLOROBENZENE	BDL	10	ug/L
BENZOIC ACID	BDL	50	ug/L
4-CHLORO-3-METHYLPHENOL	BDL	10	ug/L
2-CHLOROPHENOL	BDL	10	ug/L
2,4-DICHLOROPHENOL	BDL	10	ug/L
2,4-DIMETHYLPHENOL	BDL	10	ug/L
4,6-DINITRO-2-METHYLPHENOL	BDL	50	ug/L
2,4-DINITROPHENOL	BDL	50	ug/L
2-METHYLPHENOL	BDL	10	ug/L
4-METHYLPHENOL	BDL	10	ug/L
2-NITROPHENOL	BDL	10	ug/L
4-NITROPHENOL	BDL	50	ug/L
PENTACHLOROPHENOL	BDL	50	ug/L
PHENOL	BDL	10	ug/L
TETRACHLOROPHENOL	BDL	10	ug/L
2,4,5-TRICHLOROPHENOL	BDL	50	ug/L
2,4,6-TRICHLOROPHENOL	BDL	10	ug/L
SURROGATE RECOVERY			
2-FLUOROPHENOL	56	% Rec	
PHENOL-D5	30	% Rec	
NITROBENZENE-D5	89	% Rec	
2-FLUOROBIPHENYL	83	% Rec	
2,4,6-TRIBROMOPHENOL	81	% Rec	
TERPHENYL-D14	64	% Rec	

## GC SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW846-3510A

Analyst: M. KEEZER

Analysis Date: 22-OCT-93

Test: P233.1.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1000	ml	
FINAL VOLUME	10	ml	

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: E. WERNZ      Analysis Date: 23-OCT-93      Instrument: GC/ECD  
 Prep: GC SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW846-3510A P233.1.0

Test: 0305.1.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.00005	mg/L
BETA-BHC	BDL	0.00005	mg/L
DELTA-BHC	BDL	0.00005	mg/L
GAMMA-BHC (LINDANE)	BDL	0.00005	mg/L
HEPTACHLOR	BDL	0.00005	mg/L
ALDRIN	BDL	0.00005	mg/L
HEPTACHLOR EPOXIDE	BDL	0.00005	mg/L
ENDOSULFAN I	BDL	0.00005	mg/L
DIELDRIN	BDL	0.0001	mg/L
4,4'-DDE	BDL	0.0001	mg/L
ENDRIN	BDL	0.0001	mg/L
ENDOSULFAN II	BDL	0.0001	mg/L
4,4'-DDD	BDL	0.0001	mg/L
ENDOSULFAN SULFATE	BDL	0.0001	mg/L
4,4'-DDT	BDL	0.0001	mg/L
METHOXYCHLOR	BDL	0.0005	mg/L
ENDRIN ALDEHYDE	BDL	0.0001	mg/L
ENDRIN KETONE	BDL	0.0001	mg/L
ALPHA-CHLORDANE	BDL	0.0005	mg/L
GAMMA-CHLORDANE	BDL	0.0005	mg/L
TOXAPHENE	BDL	0.001	mg/L
PCB AROCHLOR 1016	BDL	0.0005	mg/L
PCB AROCHLOR 1221	BDL	0.0005	mg/L
PCB AROCHLOR 1232	BDL	0.0005	mg/L
PCB AROCHLOR 1242	BDL	0.0005	mg/L
PCB AROCHLOR 1248	BDL	0.0005	mg/L
PCB AROCHLOR 1254	BDL	0.0010	mg/L
PCB AROCHLOR 1260	BDL	0.0010	mg/L
DECACHLOROBIPHENYL (DCB)	103.2		Percent

## FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3005A

Analyst: E. MERRILL      Analysis Date: 27-OCT-93

Test: P130.4.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

## BARIUM ICP SW846-6010A

Analyst: R. JAO      Analysis Date: 28-OCT-93 06:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3005A P130.4.0

Test: M104.3.0

Parameter	Result	Det. Limit	Units
BARIUM	BDL	0.010	mg/L

## CADMIUM ICP SW846-6010A

Analyst: R. JAO      Analysis Date: 28-OCT-93 06:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3005A P130.4.0

Test: M108.3.0

Parameter	Result	Det. Limit	Units
CADMIUM	BDL	0.0050	mg/L

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A293865

## CHROMIUM ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 28-OCT-93 08:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3005A P130.4.0

Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	BDL	0.010	mg/L

## LEAD ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 28-OCT-93 08:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3005A P130.4.0

Test: M118.3.0

Parameter	Result	Det. Limit	Units
LEAD	BDL	0.050	mg/L

## SILVER ICP SW846-6010A

Analyst: M. JAO      Analysis Date: 28-OCT-93 08:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3005A P130.4.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	0.010	mg/L

## GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A

Analyst: C. LADO      Analysis Date: 06-NOV-93

Test: P130.6.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

## ARSENIC GFAA SW846-7060

Analyst: V. WATNESS      Analysis Date: 06-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P130.6.0

Test: M103.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	BDL	0.0050	mg/L

## SELENIUM GFAA SW846-7740

Analyst: M. BAUER      Analysis Date: 09-NOV-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P130.6.0

Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.0050	mg/L

## MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-7470

Analyst: G. MAPP      Analysis Date: 02-NOV-93

Test: P131.6.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	100		mL
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 03-NOV-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-7470 P131.6.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.00020	mg/L

## Sample Comments

BDL Below Detection Limit

Sample chain of custody number 14431.

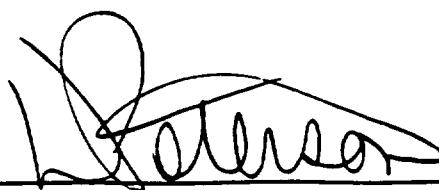
IDEM Drinking Water Certification Number C-49-01

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Sample Comments

Quality Assurance Officer:

A handwritten signature in black ink, appearing to read "Charles Jackson".

Page 6 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 27-SEP-93	Project 2506	Lab ID A291170
	Complete 20-OCT-93	PO Number 10011993-001RJA	
	Printed 20-OCT-93	Sampled	
			27-SEP-93 14:55

Report To  ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	Bill To  CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
DESCRIPTION: DP SUMP SOIL SAMPLE LOCATION: ENVIROCHEM	Sample Description

<b>TOTAL SOLIDS EPA 160.3</b>		Test: G401.7.0
Analyst: B. PRIDMORE	Analysis Date: 28-SEP-93	
SOLIDS	Parameter Result 90	Det. Limit 0.001 Units Percent

Parameter	Result	Det. Limit	Units
ACETONE	BDL	20	ug/kg
ACROLEIN	BDL	50	ug/kg
ACRYLONITRILE	BDL	70	ug/kg
BENZENE	BDL	5	ug/kg
BROMODICHLOROMETHANE	BDL	5	ug/kg
BROMOFORM	BDL	5	ug/kg
BROMOMETHANE	BDL	10	ug/kg
CARBON DISULFIDE	BDL	5	ug/kg
CARBON TETRACHLORIDE	BDL	5	ug/kg
CHLOROBENZENE	BDL	5	ug/kg
CHLOROETHANE	BDL	10	ug/kg
CHLOROFORM	BDL	5	ug/kg
CHLOROMETHANE	BDL	10	ug/kg
DIBROMOCHLOROMETHANE	BDL	5	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg
1,1-DICHLOROETHANE	BDL	5	ug/kg
1,2-DICHLOROETHANE	BDL	5	ug/kg
1,1-DICHLOROETHENE	BDL	5	ug/kg
1,2-DICHLOROPROPANE	BDL	5	ug/kg
ETHYLBENZENE	BDL	5	ug/kg
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg
2-HEXANONE	BDL	10	ug/kg
METHYLENE CHLORIDE	13	5	ug/kg
METHYL ETHYL KETONE	BDL	10	ug/kg
4-METHYL-2-PENTANONE	BDL	10	ug/kg
STYRENE	BDL	5	ug/kg
I,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg
TETRACHLOROETHENE	BDL	5	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A291170

Parameter	Result	Det. Limit	Units
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	BDL	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	BDL	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	BDL	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
TRICHLORO-TRIFLUOROETHANE	15	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	97		% Rec
TOLUENE-D8	106		% Rec
BROMOFLUOROBENZENE	98		% Rec

Sample reanalyzed with no improvement in internal standard areas.

## GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550

Analyst: C. KING Analysis Date: 04-OCT-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	1.0		ml

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: G. BARRETT Analysis Date: 05-OCT-93 17:29 Instrument: GC/MS SVFA

Test: 0505.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G, H, I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHOXY)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLOROISOPROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENYLETHER	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLOROANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENYLETHER	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A, H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg
DIETHYLPHthalate	BDL	330	ug/kg

Parameter	Result	Cet. Limit	Units
DIMETHYLPHthalATE	BDL	330	ug/kg
DI-N-BUTYLPHthalATE	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	49		% Rec
PHENOL-D5	56		% Rec
NITROBENZENE-D5	53		% Rec
2-FLUOROBIPHENYL	57		% Rec
2,4,6-TRIBROMOPHENOL	38		% Rec
TERPHENYL-D14	62		% Rec

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A291170

## PCB/PESTICIDE SCAN GC: ECD SW846-8080

Analyst: E. WERNZ      Analysis Date: 14-OCT-93      Instrument: GC/ECD  
 Prep: GC & GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Test: 0305.1.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	73.6		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER

Analysis Date: 05-OCT-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		ml

## BARIUM ICP SW846-6010A

Analyst: A. HILSCHER

Analysis Date: 05-OCT-93 17:00      Instrument: ICP

Test: M104.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	27.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: A. HILSCHER

Analysis Date: 06-OCT-93 17:00      Instrument: ICP

Test: M108.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMUM	BDL	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A291170

## CHROMIUM ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 05-OCT-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	7.5	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 06-OCT-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M116.3.0

Parameter	Result	Det. Limit	Units
LEAD	6.5	5.0	mg/kg

## SILVER ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 06-OCT-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. CARDWELL      Analysis Date: 11-OCT-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: B. HAHN      Analysis Date: 14-OCT-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## ARSENIC GFAA SW846-7060

Analyst: W. WATNESS      Analysis Date: 18-OCT-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M105.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	3.7	1.5	mg/kg
<i>1:3 DILUTION</i>			

## SELENIUM GFAA SW846-7740

Analyst: W. BAUER      Analysis Date: 14-OCT-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.050	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 11-OCT-93

Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 12-OCT-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.050	mg/kg

HERITAGE LABORATORIES, INC.

Lab Sample ID: A291170

BDL Below Detection Limit

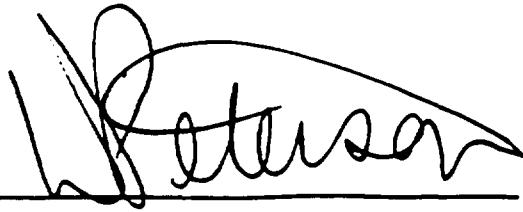
Sample Comments

Sample chain of custody number 10935.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 6 (last page)

## LIST OF COMPLETED TASKS

GC/MS CLP	GC/MS CLP	Completed 14-OCT-93
GC CLP	GC CLP	Completed 19-OCT-93
MTO CLP	METALS CLP REPORT PACKAGE	Completed 19-OCT-93
GEN CLP	GENERAL CHEMISTRY CLP	Completed 04-OCT-93

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 08-SEP-93	Project 2506	Lab ID A289443
	Complete 07-OCT-93	PO Number 10011993-001RJA	
	Printed 08-OCT-93	Sampled 08-SEP-93 14:25	

Report To	Bill To
ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
Sample Description	
SAMPLE ID: ECC-DP-06 DESCRIPTION: DECON PAD SOIL LOCATION: ENVIROCHEM	

TOTAL SOLIDS EPA 160.3		Test: G601.7.0		
Analyst: B. PRIDMORE	Analysis Date: 10-SEP-93			
SOLIDS	Parameter	Result	Det. Limit	Units
		91	0.001	Percent

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A		Test: 0510.9.0	
Analyst: G. WILSON	Analysis Date: 21-SEP-93 22:39	Instrument: GC/MS VOA	
Parameter	Result	Det. Limit	Units
ACETONE	BDL	20	ug/kg
ACROLEIN	BDL	50	ug/kg
ACRYLONITRILE	BDL	70	ug/kg
BENZENE	BDL	5	ug/kg
BROMODICHLOROMETHANE	BDL	5	ug/kg
BROMOFORM	BDL	5	ug/kg
BROMOMETHANE	BDL	10	ug/kg
CARBON DISULFIDE	BDL	5	ug/kg
CARBON TETRACHLORIDE	BDL	5	ug/kg
CHLOROBENZENE	BDL	5	ug/kg
CHLOROETHANE	BDL	10	ug/kg
CHLOROFORM	BDL	5	ug/kg
CHLORMETHANE	BDL	10	ug/kg
DIBROMOCHLOROMETHANE	BDL	5	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg
1,1-DICHLOROETHANE	BDL	5	ug/kg
1,2-DICHLOROETHANE	BDL	5	ug/kg
1,1-DICHLOROETHENE	BDL	5	ug/kg
1,2-DICHLOROPROPANE	BDL	5	ug/kg
ETHYLBENZENE	BDL	5	ug/kg
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg
2-HEXANONE	BDL	10	ug/kg
METHYLENE CHLORIDE	10	5	ug/kg
METHYL ETHYL KETONE	BDL	10	ug/kg
4-METHYL-2-PENTANONE	BDL	10	ug/kg
STYRENE	BDL	5	ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg

Parameter	Result	Det. Limit	Units
TETRACHLOROETHENE	BDL	5	ug/kg
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	BDL	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	30	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	28	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	99		% Rec
TOLUENE-D8	105		% Rec
BROMOFLUOROBENZENE	99		% Rec

**GC & GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550**

Analyst: W. WATNESS

Analysis Date: 16-SEP-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	20		mL

NOTE: SEMI-VOLATILES PREP MEASURED WITH INITIAL WEIGHT AT 30.0 GRAMS  
AND FINAL VOLUME AT 1.0 MILLILITER.

**GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550**

Analyst: J. KOCH

Analysis Date: 21-SEP-93

Test: P236.4.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	1.0		mL

**SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A**

Analyst: G. HUGHS

Analysis Date: 20-SEP-93 09:45 Instrument: GC/MS SVOA

Test: 0505.3.0

Prep: GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.4.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHoxy)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLOROISOPROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENYLETHER	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLOROANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENYLETHER	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289443

Parameter	Result	Det. Limit	Units
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg
DIETHYLPHthalATE	BDL	330	ug/kg
DIMETHYLPHthalATE	BDL	330	ug/kg
DI-N-BUTYLPHthalATE	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXAChLOROBENZENE	BDL	330	ug/kg
HEXAChLOROBUTADIENE	BDL	330	ug/kg
HEXAChLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXAChLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	26		% Rec
PHENOL-D5	36		% Rec

Parameter	Result	Det. Limit	Units
NITROBENZENE-D5	43		% Rec
2-FLUOROBIPHENYL	37		% Rec
2,4,6-TRIBROMOPHENOL	9		% Rec
TERPHENYL-D14	44		% Rec
ALSO DETECTED			
UNKNOWN	EST 130 RT=4.81		ug/kg

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: G. HUGHS

Analysis Date: 22-SEP-93 17:27 Instrument: GC/MS SVOA

Test: 0505.3.1

Prep: GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.4.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalATE	BDL	330	ug/kg
BIS(2-CHLOROETHOXY)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLOROISOPROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENYLETHER	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLOROANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENYLETHER	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg
DIETHYLPHthalATE	BDL	330	ug/kg
DIMETHYLPHthalATE	BDL	330	ug/kg
DI-N-BUTYLPHthalATE	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289443

Parameter	Result	Det. Limit	Units
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY	BDL		
2-FLUOROPHENOL	46		% Rec
PHENOL-D5	48		% Rec
NITROBENZENE-D5	47		% Rec
2-FLUOROBIPHENYL	48		% Rec
2,4,6-TRIBROMOPHENOL	18		% Rec
TERPHENYL-D14	45		% Rec
ALSO DETECTED			
UNKNOWN	EST 210 RT=4.78		ug/kg

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS

Analysis Date: 17-SEP-93

Instrument: GC/ECD

Test: 0305.1.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg

Parameter	Result	Det. Limit	Units
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	76		Percent

**FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A**

Analyst: S. SNYDER

Analysis Date: 14-SEP-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

**BARIUM ICP SW846-6010A**

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M104.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	33.	1.0	mg/kg

**CADMIUM ICP SW846-6010A**

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M108.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMUM	1.6	0.50	mg/kg

**CHROMIUM ICP SW846-6010A**

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M110.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CHROMIUM	7.0	1.0	mg/kg

**LEAD ICP SW846-6010A**

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M116.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
LEAD	5.8	5.0	mg/kg

**SILVER ICP SW846-6010A**

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M130.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289443

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER

Analysis Date: 14-SEP-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER

Analysis Date: 30-SEP-93

Test: P130.7.1

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## ARSENIC GFAA SW846-7060

Analyst: A. ROBERTSON

Analysis Date: 23-SEP-93

Instrument: GFAA

Test: M103.2.0

Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Parameter	Result	Det. Limit	Units
ARSENIC	5.4	2.0	mg/kg
1:4 DILUTION			

## SELENIUM GFAA SW846-7740

Analyst: A. ROBERTSON

Analysis Date: 01-OCT-93

Instrument: GFAA

Test: M128.2.0

Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.1

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	1.0	mg/kg
1:2 dilution			

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: G. MAPP

Analysis Date: 20-SEP-93

Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. MAPP

Analysis Date: 21-SEP-93

Instrument: CVAA

Test: M120.2.0

Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.13	mg/kg

## Sample Comments

BDL Below Detection Limit

EST Estimated Value

RT Retention Time

Sample chain of custody number 10934.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:

CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 7 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 08-SEP-93	Project 2506	Lab ID A289445
	Complete 07-OCT-93	PO Number 10011993-001RJA	
	Printed 08-OCT-93	Sampled	
			08-SEP-93 15:05

Report To  ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	Bill To  CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
Sample Description  SAMPLE ID: ECC-DP-09 DESCRIPTION: DECON PAD SOIL LOCATION: ENVIROCHEM	

<b>TOTAL SOLIDS EPA 160.3</b>			
Analyst: B. PRIDMORE	Analysis Date: 10-SEP-93	Test: G401.7.0	
Parameter	Result	Det. Limit	Units
SOLIDS	83	0.001	Percent

<b>VOLATILE ORGANICS (HEATED PURGE &amp; TRAP) SW846-8240A</b>			
Analyst: G. WILSON	Analysis Date: 21-SEP-93 23:27	Instrument: GC/MS VOA	Test: 0510.9.0
Parameter	Result	Det. Limit	Units
ACETONE	BDL	20	ug/kg
ACROLEIN	BDL	50	ug/kg
ACRYLONITRILE	BDL	70	ug/kg
BENZENE	10	5	ug/kg
BROMODICHLOROMETHANE	BDL	5	ug/kg
BROMOFORM	BDL	5	ug/kg
BROMOMETHANE	BDL	10	ug/kg
CARBON DISULFIDE	BDL	5	ug/kg
CARBON TETRACHLORIDE	BDL	5	ug/kg
CHLOROBENZENE	BDL	5	ug/kg
CHLOROETHANE	BDL	10	ug/kg
CHLOROFORM	BDL	5	ug/kg
CHLOROMETHANE	BDL	10	ug/kg
DIBROMOCHLOROMETHANE	BDL	5	ug/kg
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg
1,1-DICHLOROETHANE	BDL	5	ug/kg
1,2-DICHLOROETHANE	BDL	5	ug/kg
1,1-DICHLOROETHENE	BDL	5	ug/kg
1,2-DICHLOROPROPANE	BDL	5	ug/kg
ETHYLBENZENE	5	5	ug/kg
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg
2-HEXANONE	BDL	10	ug/kg
METHYLENE CHLORIDE	14	5	ug/kg
METHYL ETHYL KETONE	BDL	10	ug/kg
4-METHYL-2-PENTANONE	BDL	10	ug/kg
STYRENE	BDL	5	ug/kg
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg

Parameter	Result	Det. Limit	Units
TETRACHLOROETHENE	10	5	ug/kg
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	13	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	35	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	79	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	16	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	106		% Rec
TOLUENE-D8	107		% Rec
BROMOFLUOROBENZENE	95		% Rec

## GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550

Analyst: W. WATNESS

Analysis Date: 16-SEP-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	20		mL

NOTE: SEMI-VOLATILES PREP MEASURED WITH INITIAL WEIGHT OF 30.0 GRAMS AND FINAL VOLUME OF 1.0 MILLILITER.

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: E. HUGHES

Analysis Date: 20-SEP-93 10:43 Instrument: GC/MS SYOA

Test: 0505.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHOXY)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLOROISOPROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHthalate	BDL	330	ug/kg
4-BROMOPHENYLPHENylether	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLORoANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENylether	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289445

Parameter	Result	Det. Limit	Units
DIETHYLPHthalATE	BDL	330	ug/kg
DIMETHYLPHthalATE	BDL	330	ug/kg
DI-N-BUTYLPHthalATE	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	72		% Rec
PHENOL-D5	75		% Rec
NITROBENZENE-D5	76		% Rec
2-FLUOROBIPHENYL	64		% Rec
2,4,6-TRIBROMOPHENOL	55		% Rec
TERPHENYL-D14	78		% Rec

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS  
Prep: GC & GC/MS SONICATION EXTRACTION FOR ORGANICSAnalysis Date: 17-SEP-93  
Instrument: GC/ECD

Test: Q305.1.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDO	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	88.8		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER

Analysis Date: 14-SEP-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		
FINAL WEIGHT OR VOLUME	100		Grams mL

## BARIUM ICP SW846-6010A

Analyst: A. HILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M104.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	79.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: A. HILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M108.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMIUM	2.8	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289445

## CHROMIUM ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	14.	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M116.3.0

Parameter	Result	Det. Limit	Units
LEAD	12.	5.0	mg/kg

## SILVER ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER      Analysis Date: 14-SEP-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER      Analysis Date: 30-SEP-93

Test: P130.7.1

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## ARSENIC GFAA SW846-7060

Analyst: A. ROBERTSON      Analysis Date: 23-SEP-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M103.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	4.2	2.0	mg/kg
1:4 DILUTION			

## SELENIUM GFAA SW846-7740

Analyst: A. ROBERTSON      Analysis Date: 01-OCT-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.1

Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.50	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 20-SEP-93

Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 21-SEP-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.13	mg/kg

HERITAGE LABORATORIES, INC.

Lab Sample ID: A289445

BDL Below Detection Limit

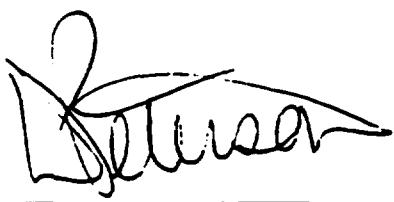
Sample Comments

Sample chain of custody number 10934.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 6 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 08-SEP-93	Project 2506	Lab ID A289446
	Complete 07-OCT-93	PO Number 10011993-001RJA	
	Printed 08-OCT-93	Sampled	
			08-SEP-93 15:35

Report To	Bill To
ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
Sample Description	
SAMPLE ID: ECC-DP-15 DESCRIPTION: DECON PAD SOIL LOCATION: ENVIROCHEM	

TOTAL SOLIDS EPA 160.3		Analysis Date: 10-SEP-93	Test: G401.7.0
Parameter	Result	Det. Limit	Units
SOLIDS	91	0.001	Percent

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A		Analysis Date: 22-SEP-93 07:07	Instrument: GC/MS VOA	Test: 0510.9.0
Parameter	Result	Det. Limit	Units	
ACETONE	BDL	20	ug/kg	
ACROLEIN	BDL	50	ug/kg	
ACRYLONITRILE	BDL	70	ug/kg	
BENZENE	7	5	ug/kg	
BROMODICHLOROMETHANE	BDL	5	ug/kg	
BROMOFORM	BDL	5	ug/kg	
BROMOMETHANE	BDL	10	ug/kg	
CARBON DISULFIDE	BDL	5	ug/kg	
CARBON TETRACHLORIDE	BDL	5	ug/kg	
CHLOROBENZENE	BDL	5	ug/kg	
CHLOROETHANE	BDL	10	ug/kg	
CHLOROFORM	BDL	5	ug/kg	
CHLOROMETHANE	BDL	10	ug/kg	
DIBROMOCHLOROMETHANE	BDL	5	ug/kg	
CIS-1,3-DICHLOROPROPENE	BDL	5	ug/kg	
DICHLORODIFLUOROMETHANE	BDL	5	ug/kg	
1,1-DICHLOROETHANE	BDL	5	ug/kg	
1,2-DICHLOROETHANE	BDL	5	ug/kg	
1,1-DICHLOROETHENE	BDL	5	ug/kg	
1,2-DICHLOROPROPANE	BDL	5	ug/kg	
ETHYLBENZENE	BDL	5	ug/kg	
FLUOROTRICHLOROMETHANE	BDL	5	ug/kg	
2-HEXANONE	BDL	10	ug/kg	
METHYLENE CHLORIDE	10	5	ug/kg	
METHYL ETHYL KETONE	BDL	10	ug/kg	
4-METHYL-2-PENTANONE	BDL	10	ug/kg	
STYRENE	BDL	5	ug/kg	
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/kg	

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289446

Parameter	Result	Det. Limit	Units
TETRACHLOROETHENE	10	5	ug/kg
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	12	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	32	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	93	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	9	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	95		% Rec
TOLUENE-D8	106		% Rec
BROMOFLUOROBENZENE	98		% Rec

## GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550

Analyst: W. WATNESS

Analysis Date: 16-SEP-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	20		mL

NOTE: SEMI-VOLATILES PREP MEASURED WITH AN INITIAL WEIGHT OF 30.0 GRAMS AND FINAL VOLUME OF 1.0 MILLILITER.

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: G. HUGHS

Analysis Date: 16-SEP-93 17:29 Instrument: GC/MS SVOA

Test: 0505.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHoxy)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLORoisopROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENylether	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLORoANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENylether	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289446

Parameter	Result	Det. Limit	Units
DIETHYLPHthalATE	BDL	330	ug/kg
DIMETHYLPHthalATE	BDL	330	ug/kg
DI-N-BUTYLPHthalATE	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	56		% Rec
PHENOL-D5	62		% Rec
NITROBENZENE-D5	70		% Rec
2-FLUOROBIPHENYL	61		% Rec
2,4,6-TRIBROMOPHENOL	19		% Rec
TERPHENYL-D14	65		% Rec

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS  
Prep: GC & GC/MS SONICATION EXTRACTION FOR ORGANICSAnalysis Date: 17-SEP-93  
Instrument: GC/ECD

Test: Q305.1.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDE	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	80.4		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER

Analysis Date: 14-SEP-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## BARIUM ICP SW846-6010A

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M104.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	37.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M108.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMIUM	1.9	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289445

## CHROMIUM ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	8.2	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M116.3.0

Parameter	Result	Det. Limit	Units
LEAD	5.7	5.0	mg/kg

## SILVER ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER      Analysis Date: 14-SEP-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER      Analysis Date: 30-SEP-93

Test: P130.7.1

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## ARSENIC GFAA SW846-7060

Analyst: A. ROBERTSON      Analysis Date: 23-SEP-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M103.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	5.6	2.0	mg/kg
<i>1:4 DILUTION</i>			

## SELENIUM GFAA SW846-7740

Analyst: A. ROBERTSON      Analysis Date: 01-OCT-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.1

Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.50	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 20-SEP-93

Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 21-SEP-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.13	mg/kg

BDL Below Detection Limit

Sample Comments

Sample chain of custody number 10934.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 6 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 08-SEP-93	Project 2506	Lab ID A289443
	Complete 07-OCT-93	PO Number 10011993-001RJA	
	Printed 08-OCT-93	Sampled	
			08-SEP-93 15:45

Report To	Bill To
ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
Sample Description	
SAMPLE ID: ECC-DP-15 (DUP) DESCRIPTION: DECON PAD SOIL LOCATION: ENVIROCHEM	

TOTAL SOLIDS EPA 160.3		Test: G401.7.0
Analyst: B. PRIDMORE	Analysis Date: 10-SEP-93	
Parameter	Result	Det. Limit
SOLIDS	92	0.001
		Percent

VOLATILE ORGANICS (HEATED PURGE & TRAP) SW846-8240A		Test: 0510.9.0
Analyst: G. WILSON	Analysis Date: 22-SEP-93 00:15	Instrument: GC/MS VOA
Parameter	Result	Det. Limit
ACETONE	BDL	20
ACROLEIN	BDL	50
ACRYLONITRILE	BDL	70
BENZENE	9	5
BROMODICHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
BROMOMETHANE	BDL	10
CARBON DISULFIDE	BDL	5
CARBON TETRACHLORIDE	BDL	5
CHLOROBENZENE	BDL	5
CHLOROETHANE	BDL	10
CHLOROFORM	BDL	5
CHLORMETHANE	BDL	10
DIBROMOCHLOROMETHANE	BDL	5
CIS-1,3-DICHLOROPROPENE	BDL	5
DICHLORODIFLUOROMETHANE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1-DICHLOROETHENE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
ETHYLBENZENE	BDL	5
FLUOROTRICHLOROMETHANE	BDL	5
2-HEXANONE	BDL	10
METHYLENE CHLORIDE	13	5
METHYL ETHYL KETONE	BDL	10
4-METHYL-2-PENTANONE	BDL	10
STYRENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289448

Parameter	Result	Det. Limit	Units
TETRACHLOROETHENE	11	5	ug/kg
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	11	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	60	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	130	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	BDL	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	106		% Rec
TOLUENE-D8	106		% Rec
BROMOFLUOROBENZENE	100		% Rec

## GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550

Analyst: W. WATNESS

Analysis Date: 16-SEP-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	20		mL

NOTE: SEMI-VOLATILES PREP MEASURED WITH AN INITIAL WEIGHT OF 30.0 GRAMS AND FINAL VOLUME OF 1.0 MILLILITER.

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: G. HUGHS

Analysis Date: 20-SEP-93 11:38 Instrument: GC/MS SVOA

Test: 0505.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G, H, I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalate	BDL	330	ug/kg
BIS(2-CHLOROETHoxy)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLORoisopROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENylether	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLORoANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENylether	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg

Parameter	Result	Det. Limit	Units
DIETHYLPHthalATE	BDL	330	ug/kg
DIMETHYLPHthalATE	BDL	330	ug/kg
DI-N-BUTYLPHthalATE	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg
2,4-DINITROTOLUENE	BDL	330	ug/kg
2,6-DINITROTOLUENE	BDL	330	ug/kg
DI-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
HEXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
HEXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
HEXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
ISOPHORONE	BDL	330	ug/kg
2-METHYLNAPHTHALENE	BDL	330	ug/kg
NAPHTHALENE	BDL	330	ug/kg
2-NITROANILINE	BDL	1600	ug/kg
3-NITROANILINE	BDL	1600	ug/kg
4-NITROANILINE	BDL	1600	ug/kg
NITROBENZENE	BDL	330	ug/kg
N-NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
PHENANTHRENE	BDL	330	ug/kg
2-PICOLINE	BDL	1600	ug/kg
PYRENE	BDL	330	ug/kg
PYRIDINE	BDL	1600	ug/kg
TETRACHLOROBENZENES	BDL	330	ug/kg
TOLUENEDIAMINE	BDL	1600	ug/kg
1,2,4-TRICHLOROBENZENE	BDL	330	ug/kg
BENZOIC ACID	BDL	1600	ug/kg
4-CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
2-CHLOROPHENOL	BDL	330	ug/kg
2,4-DICHLOROPHENOL	BDL	330	ug/kg
2,4-DIMETHYLPHENOL	BDL	330	ug/kg
4,6-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
2,4-DINITROPHENOL	BDL	1600	ug/kg
2-METHYLPHENOL	BDL	330	ug/kg
4-METHYLPHENOL	BDL	330	ug/kg
2-NITROPHENOL	BDL	330	ug/kg
4-NITROPHENOL	BDL	1600	ug/kg
PENTACHLOROPHENOL	BDL	1600	ug/kg
PHENOL	BDL	330	ug/kg
TETRACHLOROPHENOL	BDL	330	ug/kg
2,4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
2,4,6-TRICHLOROPHENOL	BDL	330	ug/kg
SURROGATE RECOVERY			
2-FLUOROPHENOL	47		% Rec
PHENOL-D5	52		% Rec
NITROBENZENE-D5	54		% Rec
2-FLUOROBIPHENYL	47		% Rec
2,4,6-TRIBROMOPHENOL	25		% Rec
TERPHENYL-D14	59		% Rec

## PCB/PESTICIDE SCAN GC:ECD SW846-8080

Analyst: L. DOBBINS

Analysis Date: 17-SEP-93 Instrument: GC/ECD

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Test: Q305.1.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	70.2		Percent

## FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SKYDER

Analysis Date: 14-SEP-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## BARIUM ICP SW846-6010A

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M104.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
BARIUM	35.	1.0	mg/kg

## CADMIUM ICP SW846-6010A

Analyst: A. NILSCHER

Analysis Date: 14-SEP-93 17:00 Instrument: ICP

Test: M108.3.0

Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Parameter	Result	Det. Limit	Units
CADMIUM	1.9	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289448

## CHROMIUM ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M110.3.0

Parameter	Result	Det. Limit	Units
CHROMIUM	7.7	1.0	mg/kg

## LEAD ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M116.3.0

Parameter	Result	Det. Limit	Units
LEAD	6.9	5.0	mg/kg

## SILVER ICP SW846-6010A

Analyst: A. HILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M130.3.0

Parameter	Result	Det. Limit	Units
SILVER	BDL	1.0	mg/kg

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER      Analysis Date: 14-SEP-93

Test: P130.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A

Analyst: S. SNYDER      Analysis Date: 30-SEP-93

Test: P130.7.1

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

## ARSENIC GFAA SW846-7060

Analyst: A. ROBERTSON      Analysis Date: 23-SEP-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.0

Test: M103.2.0

Parameter	Result	Det. Limit	Units
ARSENIC	5.8	2.0	mg/kg
I:4 DILUTION			

## SELENIUM GFAA SW846-7740

Analyst: A. ROBERTSON      Analysis Date: 01-OCT-93      Instrument: GFAA  
 Prep: GFAA ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P130.7.1

Test: M128.2.0

Parameter	Result	Det. Limit	Units
SELENIUM	BDL	0.50	mg/kg

## MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 20-SEP-93

Test: P131.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	0.4		Grams
FINAL VOLUME	100		mL

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. MAPP      Analysis Date: 21-SEP-93      Instrument: CVAA  
 Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.13	mg/kg

HERITAGE LABORATORIES, INC.

Lab Sample ID: A289448

BDL Below Detection Limit

Sample Comments

Sample chain of custody number 10934.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:

CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer: \_\_\_\_\_



Page 6 (last page)

**C E R T I F I C A T E   O F   A N A L Y S I S**

Service Location  HERITAGE LABORATORIES, INC. 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8305	Received 08-SEP-93	Project 2506	Lab ID A289459
	Complete 07-OCT-93	PO Number 10011993-001RJA	
	Printed 08-OCT-93	Sampled	
			08-SEP-93 10:10

Report To  ROBERT J. AUTIO QUALITY ENVIRONMENTAL MANAGEMENT 1640 STRICKLAND MARTINSVILLE, IN 46151	BILL TO  CHARLES JACKSON QUALITY ENVIRONMENTAL MANAGEMENT RR 1, BOX 555 ROCKVILLE, IN 47872
Sample Description  SAMPLE ID: ECC-DP-22 DESCRIPTION: DECON PAD SOIL LOCATION: ENVIROCHEM	

<b>TOTAL SOLIDS EPA 160.3</b>		Test: G401.7.0
Analyst: B. PRIDMORE	Analysis Date: 10-SEP-93	
SOLIDS	Result 88	Det. Limit 0.001

<b>VOLATILE ORGANICS (HEATED PURGE &amp; TRAP) SW846-8240A</b>		Test: G510.9.0
Analyst: G. WILSON	Analysis Date: 22-SEP-93 09:32	Instrument: GC/MS VOA
Parameter	Result	Det. Limit
ACETONE	BDL	20
ACROLEIN	BDL	50
ACRYLONITRILE	BDL	70
BENZENE	BDL	5
BROMODICHLOROMETHANE	BDL	5
BROMOFORM	BDL	5
BROMOMETHANE	BDL	10
CARBON DISULFIDE	BDL	5
CARBON TETRACHLORIDE	BDL	5
CHLOROBENZENE	BDL	5
CHLOROETHANE	BDL	10
CHLOROFORM	BDL	5
CHLOROMETHANE	BDL	10
DIBROMOCHLOROMETHANE	BDL	5
CIS-1,3-DICHLOROPROPENE	BDL	5
DICHLORODIFLUOROMETHANE	BDL	5
1,1-DICHLOROETHANE	BDL	5
1,2-DICHLOROETHANE	BDL	5
1,1-DICHLOROETHENE	BDL	5
1,2-DICHLOROPROPANE	BDL	5
ETHYLBENZENE	BDL	5
FLUOROTRICHLOROMETHANE	BDL	5
2-HEXANONE	BDL	10
METHYLENE CHLORIDE	8	5
METHYL ETHYL KETONE	BDL	10
4-METHYL-2-PENTANONE	BDL	10
STYRENE	BDL	5
1,1,2,2-TETRACHLOROETHANE	BDL	5

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289459

Parameter	Result	Det. Limit	Units
TETRACHLOROETHENE	BDL	5	ug/kg
TETRAHYDROFURAN	BDL	25	ug/kg
TOLUENE	7	5	ug/kg
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/kg
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/kg
1,1,1-TRICHLOROETHANE	10	5	ug/kg
1,1,2-TRICHLOROETHANE	BDL	5	ug/kg
TRICHLOROETHENE	49	5	ug/kg
VINYL ACETATE	BDL	10	ug/kg
VINYL CHLORIDE	BDL	10	ug/kg
XYLENE (TOTAL)	10	5	ug/kg
SURROGATE RECOVERY			
DICHLOROETHANE-D4	96		% Rec
TOLUENE-D8	105		% Rec
BROMOFLUOROBENZENE	94		% Rec

## GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550

Analyst: W. WATNESS

Analysis Date: 16-SEP-93

Test: P236.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	30.0		Grams
FINAL VOLUME	20		mL

NOTE: SEMI-VOLATILES PREP MEASURED WITH INITIAL WEIGHT OF 30.0 GRAMS AND FINAL VOLUME OF 1.0 MILLILITER.

## SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A

Analyst: G. MUGHES

Analysis Date: 20-SEP-93 12:53 Instrument: GC/MS SYOA

Test: 0505.3.0

Prep: GC &amp; GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Parameter	Result	Det. Limit	Units
ACENAPHTHENE	BDL	330	ug/kg
ACENAPHTHYLENE	BDL	330	ug/kg
ANTHRACENE	BDL	330	ug/kg
BENZ(A)ANTHRACENE	BDL	330	ug/kg
BENZO(A)PYRENE	BDL	330	ug/kg
BENZO(B)FLUORANTHENE	BDL	330	ug/kg
BENZO(G,H,I)PERYLENE	BDL	330	ug/kg
BENZO(K)FLUORANTHENE	BDL	330	ug/kg
BENZYL ALCOHOL	BDL	330	ug/kg
BENZYLBUTYLPHthalATE	BDL	330	ug/kg
BIS(2-CHLOROETHoxy)METHANE	BDL	330	ug/kg
BIS(2-CHLOROETHYL)ETHER	BDL	330	ug/kg
BIS(2-CHLORoisOPROPYL)ETHER	BDL	330	ug/kg
BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330	ug/kg
4-BROMOPHENYLPHENylether	BDL	330	ug/kg
CARBAZOLE	BDL	330	ug/kg
4-CHLORoANILINE	BDL	330	ug/kg
2-CHLORONAPHTHALENE	BDL	330	ug/kg
4-CHLOROPHENYLPHENylether	BDL	330	ug/kg
CHRYSENE	BDL	330	ug/kg
DIBENZ(A,H)ANTHRACENE	BDL	330	ug/kg
DIBENZOFURAN	BDL	330	ug/kg
1,2-DICHLOROBENZENE	BDL	330	ug/kg
1,3-DICHLOROBENZENE	BDL	330	ug/kg
1,4-DICHLOROBENZENE	BDL	330	ug/kg
3,3'-DICHLOROBENZIDINE	BDL	660	ug/kg

Parameter	Result	Det. Limit	Units
DIETHYLPHthalATE	BDL	330	ug/kg
IMETHYLPHthalATE	BDL	330	ug/kg
I-N-BUTYLPHthalATE	BDL	330	ug/kg
DINITROBENZENES	BDL	1600	ug/kg
,4-DINITROTOLUENE	BDL	330	ug/kg
,6-DINITROTOLUENE	BDL	330	ug/kg
1I-N-OCTYLPHthalATE	BDL	330	ug/kg
FLUORANTHENE	BDL	330	ug/kg
FLUORENE	BDL	330	ug/kg
EXACHLOROBENZENE	BDL	330	ug/kg
HEXACHLOROBUTADIENE	BDL	330	ug/kg
EXACHLOROCYCLOPENTADIENE	BDL	330	ug/kg
EXACHLOROETHANE	BDL	330	ug/kg
INDENO(1,2,3-CD)PYRENE	BDL	330	ug/kg
OPHORONE	BDL	330	ug/kg
METHYLNAPHTHALENE	BDL	330	ug/kg
APHTHALENE	BDL	330	ug/kg
-NITROANILINE	BDL	1600	ug/kg
NITROANILINE	BDL	1600	ug/kg
NITROANILINE	BDL	1600	ug/kg
ITROBENZENE	BDL	330	ug/kg
NITROSO-DIPHENYLAMINE	BDL	330	ug/kg
NITROSO-DI-N-PROPYLAMINE	BDL	330	ug/kg
nENANTHRENE	BDL	330	ug/kg
PICOLINE	BDL	1600	ug/kg
RENE	BDL	330	ug/kg
RIDINE	BDL	1600	ug/kg
ETRACHLOROBENZENES	BDL	330	ug/kg
UENEDIAMINE	BDL	1600	ug/kg
,4-TRICHLOROBENZENE	BDL	330	ug/kg
ENZOIC ACID	BDL	1600	ug/kg
CHLORO-3-METHYLPHENOL	BDL	330	ug/kg
CHLOROPHENOL	BDL	330	ug/kg
,2-DICHLOROPHENOL	BDL	330	ug/kg
4-DIMETHYLPHENOL	BDL	330	ug/kg
-DINITRO-2-METHYLPHENOL	BDL	1600	ug/kg
-DINITROPHENOL	BDL	1600	ug/kg
METHYLPHENOL	BDL	330	ug/kg
ETHYLPHENOL	BDL	330	ug/kg
ITROPHENOL	BDL	330	ug/kg
NITROPHENOL	BDL	1600	ug/kg
MTACHLOROPHENOL	BDL	1600	ug/kg
OL	BDL	330	ug/kg
RACHLOROPHENOL	BDL	330	ug/kg
4,5-TRICHLOROPHENOL	BDL	1600	ug/kg
6-TRICHLOROPHENOL	BDL	330	ug/kg
ROGATE RECOVERY			
UOROPHENOL	69		% Rec
.1OL-D5	75		% Rec
POBENZENE-D5	77		% Rec
UOROBIPHENYL	64		% Rec
6-TRIBROMOPHENOL	55		% Rec
PHENYL-D14	66		% Rec

**PCB/PESTICIDE SCAN GC:ECD SW846-8080**

Analyst: L. DOBBINS      Analysis Date: 17-SEP-93      Instrument: GC/ECD  
 Prep: GC & GC/MS SONICATION EXTRACTION FOR ORGANICS SW846-3550 P236.0.0

Test: Q305.1.0

Parameter	Result	Det. Limit	Units
ALPHA-BHC	BDL	0.008	mg/kg
BETA-BHC	BDL	0.008	mg/kg
DELTA-BHC	BDL	0.008	mg/kg
GAMMA-BHC (LINDANE)	BDL	0.008	mg/kg
HEPTACHLOR	BDL	0.008	mg/kg
ALDRIN	BDL	0.008	mg/kg
HEPTACHLOR EPOXIDE	BDL	0.008	mg/kg
ENDOSULFAN I	BDL	0.008	mg/kg
DIELDRIN	BDL	0.016	mg/kg
4,4'-DDE	BDL	0.016	mg/kg
ENDRIN	BDL	0.016	mg/kg
ENDOSULFAN II	BDL	0.016	mg/kg
4,4'-DDD	BDL	0.016	mg/kg
ENDOSULFAN SULFATE	BDL	0.016	mg/kg
4,4'-DDT	BDL	0.016	mg/kg
METHOXYCHLOR	BDL	0.08	mg/kg
ENDRIN ALDEHYDE	BDL	0.016	mg/kg
ENDRIN KETONE	BDL	0.016	mg/kg
ALPHA-CHLORDANE	BDL	0.08	mg/kg
GAMMA-CHLORDANE	BDL	0.08	mg/kg
TOXAPHENE	BDL	0.16	mg/kg
PCB AROCHLOR 1016	BDL	0.08	mg/kg
PCB AROCHLOR 1221	BDL	0.08	mg/kg
PCB AROCHLOR 1232	BDL	0.08	mg/kg
PCB AROCHLOR 1242	BDL	0.08	mg/kg
PCB AROCHLOR 1248	BDL	0.08	mg/kg
PCB AROCHLOR 1254	BDL	0.16	mg/kg
PCB AROCHLOR 1260	BDL	0.16	mg/kg
DECACHLOROBIPHENYL (DCB)	89.8	Percent	

**FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A**

Analyst: S. SNYDER      Analysis Date: 16-SEP-93

Test: P129.7.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1		Grams
FINAL WEIGHT OR VOLUME	100		mL

**BARIUM ICP SW846-6010A**

Analyst: A. NILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M104.3.0

Parameter	Result	Det. Limit	Units
BARIUM	54.	1.0	mg/kg

**CADMIUM ICP SW846-6010A**

Analyst: A. NILSCHER      Analysis Date: 14-SEP-93 17:00      Instrument: ICP  
 Prep: FAA OR ICP ACID DIGESTION OF S/S/S SAMPLES SW846-3050A P129.7.0

Test: M108.3.0

Parameter	Result	Det. Limit	Units
CADMIUM	2.2	0.50	mg/kg

## HERITAGE LABORATORIES, INC.

Lab Sample ID: A289459

## MERCURY CVAA SW846-7471(MOD)

Analyst: G. MAPP

Analysis Date: 21-SEP-93 Instrument: CVAA

Prep: MERCURY CVAA ACID DIGESTION OF S/S/S SAMPLES SW846-7471(MOD) P131.7.0

Test: M120.2.0

Parameter	Result	Det. Limit	Units
MERCURY	BDL	0.13	mg/kg

## Sample Comments

BDL Below Detection Limit

Sample chain of custody number 10934.

This Certificate shall not be reproduced, except in full,  
without the written approval of the lab.

Additional copies of this report sent to:  
CHARLES JACKSON, QUALITY ENVIRONMENTAL MANAGEMENT  
RR 1, BOX 555, ROCKVILLE, IN 47872

Quality Assurance Officer:



Page 6 (last page)

**APPENDIX C**  
**SAMPLE CHAIN OF CUSTODY FORM**



**ERM**

# **Environmental Resources Management**

## SAMPLE CHAIN OF CUSTODY

**APPENDIX D**

**FIELD SAMPLING AND ANALYTICAL PROCEDURES**



**SAMPLING METHOD SM1-H**

**HYDRAULICALLY POWERED SOIL GAS SAMPLING**

**MICROSEEPS** 

**University of Pittsburgh Applied Research Center  
220 William Pitt Way  
Pittsburgh, PA 15238  
(412) 826-5245**

## SAMPLING METHOD SM1-H

### **HYDRAULICALLY POWERED SOIL GAS SAMPLING**

#### **1.0 Scope and Application**

1.1 Soil gas samples are collected with a hydraulically powered soil gas sampling system which permits sampling to depths of 20 to 25 feet. In addition, the system provides that the sample is taken through disposable tubing which minimizes the potential for site to site carryover.

#### **2.0 Apparatus**

2.1 Geoprobe Soil Probe Unit: The system consists of a truck mounted, hydraulically powered soil probe unit which has a 40" stroke with the main cylinder supplying 15,000 lbs. of force (down) and 12,000 lbs. of pull (up). The hydraulic hammer delivers over 1800 blows per minute and is capable of rotating from 0 - 300 rpm for drilling of surface pavements.

2.2 Geoprobe soil gas sampling equipment: The sampling equipment consists of the following; drive cap (part# AT-11B), 3 foot probe rod (part# AT10B), pull cap (part# AT12B), PRT expendable point holder (part# PR-13B), expendable drive point (part# AT14), 1/4 inch O.D. polyethylene tubing (part# TB-17L), tubing adapter (part# PR-17S), and adapter o-rings (part# PR-25R). The number of probe rods necessary is determined by the required sampling depth.

2.3 Modified Magnum Syringe: A Precision Sampling Inc. 250 cc magnum syringe (part# 060041) fitted with a three way stainless steel ball valve (Whitey part# SS-42XS4). The common port of the three way valve is connected directly to the syringe nose piece or inlet. The second port is connected to a two inch length of 1/4 inch o.d. stainless steel tubing fitted with a 1 1/2 inch length of silicon tubing which is used for connecting to the 1/4 inch sample tubing. This facilitates the transfer of soil gas from bottom hole to the syringe. The third port is connected directly to a syringe needle fitting via a three inch length of stainless steel 1/4 inch O.D. tubing. Attached to the syringe needle fitting is a disposable needle (Becton Dickinson & Co., part# 5145). This port facilitates transfer of the sample from the syringe to sample vial.

2.4 Sample vials: 22 ml glass vials (Hewlett Packard #9301-0716 or equivalent). Other sample vials may be used depending on the analytical method required. All vials should be free of interferences and meet the specifications described in the analytical method to be used. Sample vials are to be prepared in a

clean laboratory, fitted with a teflon lined septum (Wheaton #224168 or equivalent) and evacuated prior to use in the field. Prepared vials should not be used after two weeks.

### 3.0 Procedure

3.01 The hydraulically powered Geoprobe system is used in accordance with the Geoprobe Operation Manual and training program. After the rods are driven to the desired depth, the soil gas sample is collected using the Post-Run Tubing (PRT) System.

3.02 Once the probe rods are driven to the desired depth they should be pulled up 3 to 4 inches to disengage the drive point and expose a conduit for the soil gases to be sampled. Next, remove the pull cap from the top rod.

3.03 A length of 1/4 inch polyethylene tubing should be cut two feet longer than the total length of rods being used. Secure the tubing adapter to one end of the tubing.

3.04 Insert the adapter end of the tubing down the inside diameter of the probe rods. Feed the tubing down the hole until it hits bottom on the expendable point holder.

3.05 Grasp the excess tubing and apply some downward pressure while turning it in a counter-clockwise motion to engage the adapter threads with the expendable point holder.

3.06 Pull up lightly on the tubing to test engagement of the threads. Once the adapter o-ring is properly seated, the soil gases may be drawn through the point holder, through the adapter, and into the sample tubing.

3.07 Prior to any sampling, the soil gas sampling syringe should be purged clean of interferences, the syringe needle should be removed, and the three way valve should be in the stop flow position.

3.08 Connect the sampling syringe to the sample tubing using the 1 1/2 inch length of silicon tubing.

3.09 Turn the three way valve to the sample tubing/syringe position.

3.10 Draw into the syringe a volume equal to the volume of sample tubing being used.

3.11 Attach the syringe needle and turn the three way valve to the syringe/needle position. Discard the syringe volume through the needle to the atmosphere.

3.12 Turn the three way valve back to the sample tubing/syringe position and draw the appropriate amount of soil gas into the syringe.

3.13 Turn the three way valve to the stop flow position.

3.14 Attach an evacuated sample vial by inserting the syringe needle through the septum.

3.15 Turn the three way valve to the syringe/needle position. A volume of gas equal to the volume of the evacuated vial will be drawn into the sample vial. Additional volume (positive pressure) can then be added by depressing the plunger and displacing the remaining volume in the syringe into the vial.

3.16 The sample vial should be quickly removed once the desired volume is displaced.

3.17 A volume of approximately 50 cc of ambient air should be drawn back through the needle.

3.18 Remove the needle.

3.19 Remove the sample syringe from the sample tubing.

3.20 Purge the sample probe clean of interferences by filling and exhausting the syringe five times before taking the next sample.

3.21 Remove the sample tubing from probe rods by quickly pulling upward on the tubing until it releases from the the adapter fitting. Discard the used sampling tubing.

#### 4.0 Sample Documentation

4.1 All samples should be labeled immediately after collection with the following information:

1. Site number
2. Daily sequence number
3. Date and time
4. Samplers initials
5. Project

4.2 All samples taken in the field by Microseeps should be entered onto a Field Log Sheet. For each log sheet the header should contain the sampler(s) name, project location, project number and page number. For each sample, the following entries will be made:

1. Site number or name
2. Daily sequence number
3. Date and time
4. Sample description
5. Miscellaneous comments

4.3 When appropriate, samples will be security sealed and chain of custody records will be maintained.

## 5.0 Safety Precautions

5.1 Do not use a mechanical device to depress the sampling syringe plunger.

5.2 Do not attempt to collect soil gas probe samples without prior knowledge of the location of underground utilities and other possible environmental hazards.

5.3 Always cap or remove the soil gas syringe needle when transporting or handling the soil gas sampling syringe.

5.4 The Geoprobe hydraulic system should be operated only by trained/authorized personnel and in accordance with Geoprobe Systems recommended procedures.

## 6.0 Quality Control

6.0 The soil gas sampling syringe should be cleaned when necessary or at the end of each day with soap and organic free water. It is especially important to keep it clean from fine soil particles as the particles will quickly deteriorate the teflon/glass plunger seal.

6.1 The sampling syringe should be purged at least five times with contaminant free air prior to sampling.

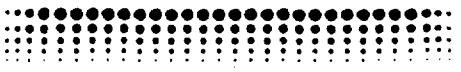
6.2 The soil gas sample vial is pressurized at the time of sampling. This pressure preserves sample integrity since any leakage is out of the vial and does not result in contamination or sample dilution.

6.3 The PTR system parts should be cleaned with VOC free water or decontaminated as required prior to use. This includes the expendable point holder, tubing adapter and o-ring. It is recommended that several sets of these parts be kept on hand and be used on a rotational basis. This gives freshly cleaned parts time to completely dry prior to use.

6.4 The expendable point and tubing should be used only once.

6.5 The adapter o-ring seal should be inspected after removal of the rods from the hole. The adapter should be seated properly in the expendable point holder threads and the o-ring must be compressed. This assures that a proper seal was obtained.

6.6 In the event that parameters set forth in this method are not met, the sampling program should be terminated until proper procedures are implemented.



**SAMPLING METHOD**

**SM5**

**SOIL SAMPLING FOR ANALYSIS OF VOLATILE ORGANICS  
USING STATIC HEADSPACE ANALYSIS**

**MICROSEEPS**



**University of Pittsburgh Applied Research Center  
220 William Pitt Way  
Pittsburgh, PA 15238  
(412) 826-5245**

## SAMPLING METHOD SM5

### **SOIL SAMPLING FOR ANALYSIS OF VOLATILE ORGANICS USING STATIC HEADSPACE ANALYSIS**

#### **1.0 Scope and Application**

1.1 Soil samples are collected with a soil coring device. A measured volume of soil is taken from the core sample and immediately placed in a vial with distilled water. The vial is quickly capped, labeled, then transported to a laboratory for static headspace analysis. The amount of time the soil sample is exposed to ambient air is kept as short as possible which minimizes the loss of volatile organics compounds.

#### **2.0 Apparatus**

2.1 Soil Core Sampler: JMC Environmentalist's Sub-Soil Probe Kit (PN150) or equivalent. Kit includes 36 inch sampling tube, drop hammer assembly, copolyester liners, and liner caps. Sampling tube extensions are required for depths greater than three feet. Other sources of obtaining soil cores may be used such as drill rigs and hydraulic driven hammers which may also collect split spoon or shelby tube cores.

2.2 Modified Disposable Syringe: 5 cc (B-D 9603) cut off at the 0cc scale level.

2.3 Sample vials: 22 ml glass vials (Hewlett Packard #9301-0716 or equivalent). Vials should be free of all interfering compounds prior to use. This can be accomplished by washing and rinsing with hydrocarbon free water followed by heating to 100 degrees C for 1 hour followed by purging with pure nitrogen.

2.4 Vial Labels: Avery 1 in. x 3 in. non-removable or equivalent.

2.5 Septums: Teflon lined septums (Wheaton #224168 or equivalent) may be used.

2.6 Crimp-on Caps: 20mm aluminum seal with out center (The West Co. part# 51200210 or equivalent).

2.7 Vial Cap Crimper: 20mm hand operated (Wheaton #224303).

2.8 Distilled Water: Interference free.

2.9 Scale: Capable of .01 gram resolution.

2.10 Bottle Type Pipette Dispenser: 1.0 to 10.9 ml (Fisher 13-706-3).

### 3.0 Procedure

3.1 Place labels on vials meeting specifications described in 2.2 and 2.3. Without crimping, set the cap and septum on the vial. Pre-weigh the vial and record the weight on the vial label. The cap and septum should remain on the vial, not crimped, until just prior to placing the soil sample in the vial.

3.1 The soil core should be collected using the appropriate operating instructions supplied with the sampling device. In addition to obtaining a core with hand tools the core may also be collected with a drill rig or a hydraulic driven hammer as described in section 2.1.

3.2 Immediately upon removal of the soil core from the coring device, a 3.5cc volume of soil sample should transferred into the 22ml vial. This is accomplished by pushing the modified 5cc syringe into the soil core until 3cc of sample is obtained. The 5cc syringe can then be held tightly against the mouth of the 22ml vial. Next depress the syringe plunger until all the soil has been displaced into the vial.

3.3 Quickly pipette 7ml of distilled water into the 22ml vial and immediately crimp on the cap and septum.

3.4 Post-weigh the vial and record the soil sample weight as follows: SOIL WEIGHT = POSTWEIGHT - (PREWEIGHT + 7g).

3.5 Record all sample documentation as described in section 4.0.

### 4.0 Sample Documentation

4.1 All samples should be labeled immediately after collection with the following information:

1. Site number
2. Daily sequence number
3. Date and time
4. Samplers initials
5. Project
6. Preweight
7. Soil sample weight

4.2 All samples taken in the field by Microseeps, Ltd. should be entered onto a Sample Collection Log Sheet. For each sample, the following entries should be made:

1. Site number
2. Daily sequence number
3. Date and time
4. Sample description
5. Miscellaneous comments

For each log sheet the following entries should be made:

1. Samplers initials
2. Project
3. Location
4. Miscellaneous comments

4.3 All entries on labels and field log sheets shall be made in black ink using a waterproof permanent marking utensil.

4.4 Corrections to either of the documents mentioned in 4.1 and 4.2 shall be made by an initialed single-line strike.

4.5 All abnormal sampling conditions should be recorded as miscellaneous comments.

4.5 When appropriate, samples will be security sealed and chain of custody records will be maintained.

## 5.0 Safety Precautions

5.1 When required, a site specific health and safety plan should be written and implemented.

5.2 Do not attempt to collect soil samples without prior knowledge of the location of underground utilities and other possible environmental hazards.

5.3 Proper dress should always be maintained for the particular work being performed.

5.4 All safety precautions and instructions supplied with the core sampling equipment should be followed.

5.5 Never attempt to operate equipment without proper knowledge and training.

## 6.0 Quality Control

6.0 The modified 5cc syringes used to transfer the sample into the vial should be used one time only.

6.1 The JMC Environmentalist's Sub-Soil Probe utilizes removable core liners which are used one time only.

6.2 To minimize possible contamination of the distilled water in the field the water container should remain sealed when near any source of contamination.

6.3 A distilled water blank (a vial containing 10ml of water) should be collected at the beginning of each project, after every tenth sample, and whenever a new batch of distilled water is used.

6.4 The caps and septa should remain in place on the vials until just prior to placing the soil in the vial to minimize any contamination from entering the bottle.

6.5 All soil coring surfaces that have a potential for carry over contamination, such as core barrel tips or cutting shoes, should be cleaned with VOC free water or decontaminated as required between sample collection prior to use. It is recommended that several sets of these parts be kept on hand and be used on a rotational basis. This gives freshly cleaned parts time to completely dry prior to use.

6.6 The 3.5cc volume of soil should be collected from the center of the core sample to further insure sample integrity.

6.7 In the event that parameters set forth in this method are not met, the sampling program should be terminated until proper procedures are implemented.

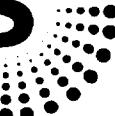


**ANALYTICAL METHOD**

**AM4.02**

**ANALYSIS OF VOLATILE ORGANIC COMPOUNDS IN SOIL GAS**

**MICROSEEPS**



**University of Pittsburgh Applied Research Center  
220 William Pitt Way  
Pittsburgh, PA 15238  
(412) 826-5245**

## ANALYTICAL METHOD AM4.02

### **ANALYSIS OF VOLATILE ORGANIC COMPOUNDS IN SOIL GAS**

#### **1.0 Scope and Application**

1.1 Method AM4.02 is used to determine the concentration of volatile organic compounds in soil gas samples. Specifically, Method AM4.02 may be used to detect the following compounds:

pentane	benzene
hexane	toluene
heptane	m & p-xylene
octane	o-xylene
nonane	ethyl benzene
decane	freon 113
chloromethane	bromomethane
vinyl chloride	chloroethane
1,1-dichloroethylene	fluorotrichloromethane
methylene chloride	1,2-dichloropropane
1,1-dichloroethane	bromodichloromethane
1,2-dichloroethane	cis 1,3-dichloropropylene
trans 1,2-dichloroethylene	trans 1,3-dichloropropylene
chloroform	1,1,2-trichloroethane
1,1,1-trichloroethane	chlorodibromomethane
carbon tetrachloride	chlorobenzene
trichloroethylene	bromoform
tetrachloroethylene	1,2-dichlorobenzene
1,1,2,2-tetrachloroethane	1,4-dichlorobenzene
1,3-dichlorobenzene	acetone
methyl t-butyl ether	2-butanone
undecane	dodecane
tridecane	tetradecane
pentadecane	hexadecane
heptadecane	octadecane

1.2 This method is recommended for use by, or under the supervision of, analysts experienced in the operation of a gas chromatograph and in the interpretation of a chromatogram.

#### **2.0 Summary of Method**

The volatile organic compounds are analyzed using a Hewlett Packard Model 5890A Gas Chromatograph in conjunction with a Tekmar Model 7000 Automated Headspace Sampler and an H.P. 3396A Networking Integrator. A Supelco, 60M x 0.75mm i.d. Vocol, wide bore capillary column is used in conjunction with an output splitter connected to an electron capture detector and a flame ionization detector. The

integrator is interfaced to a microcomputer for data storage and processing. Data transfer and analyses are facilitated using a chromatography data system (Chrom Perfect, Justice Innovations).

### 3.0 Interferences

3.1 Contamination by carryover can occur whenever high-level and low-level samples are sequentially analyzed. The Tekmar 7000 provides continuous flushing of the sample loop and sample valve while in the standby mode between analyses. This flush flow should be maintained and the sample valve and loop should be kept heated.

3.2 The analyst should demonstrate the absence of carryover contamination by analysis of the contents of the sample loop when purged with pure nitrogen. This demonstration should be performed prior to the analysis of a sample set and when carryover contamination is suspected (after high samples). In the event that 'ghost peaks' (peaks similar to previous sample) appear when a pure nitrogen sample is analyzed measures should be taken to eliminate the carryover contamination.

3.3 Extra peaks in a chromatogram can be actual peaks from a previous run. Contamination from late eluting peaks can occur when injection to injection time is too short or when the column conditioning program described in section 3.4 is not adequate. The HP 5890A is equipped with a temperature programmable oven which can be utilized to minimize this interference.

3.4 The analyst should be certain that all compounds have eluted from the previous analysis prior to analyzing any sample or standard. This can be accomplished by elevating the oven temperature after an analysis until such time that a clean stable baseline is obtained. If samples or standard chromatograms contain suspected 'extra peaks' the sample should be reanalyzed after a clean baseline is established.

3.5 Other interferences that affect the sample analysis can come from sample vials, vial septums, needles and equipment used to collect the sample. Before and during sample analysis, sample blanks (evacuated vials filled with high purity nitrogen, and sample vials from the field filled with ambient air) should be analyzed to assure the absence of interferences.

### 4.0 Materials and Equipment

4.1 Sample vials: 22 ml glass vials (Hewlett Packard #9301-0716 or equivalent). Vials should be free of all interfering compounds prior to use. This can be accomplished by washing and rinsing with hydrocarbon free water followed by heating to 100 degrees C for 1 hour followed by purging with pure nitrogen.

4.2 Septums: Teflon lined septums (Wheaton #224168 or

equivalent) may be used.

4.3 Gas Chromatograph: The Hewlett Packard 5890A Gas Chromatograph is equipped with a Supelco, 60M x 0.75mm i.d. Vocol, wide bore capillary column connected to an electron capture detector and flame ionization detector.

4.4 Headspace Sampler: A Tekmar (Model 7000) equipped with a Tekmar (Model 7050) automated carrousel is used. The carrousel contains 50 slots for headspace vials. The vials are automatically transferred from the carrousel to a platen where they are heated for a preset time prior to injection. The headspace sampler also contains a heated sample valve, heated sample loop and heated transfer line to facilitate transfer of the sample onto the column in the gas chromatograph.

4.5 Data Collection: The output of the chromatograph is directed to a Hewlett Packard (HP-3396A) Networking Integrator which passes the data to a personal computer for data processing with Chrom Perfect software.

## 5.0 Sample Preparation and Analysis

5.1 Sample vial preparation: All sample vials should meet specifications as noted in sections 4.1 and 4.2 above. Vials should be tightly capped and evacuated to a pressure of less than 100 millitorr. The vial septum should be punctured only with needles of 22 gauge or smaller.

5.2 The evacuated sample vials should be filled with sample or standard gas to a positive gauge pressure. Sample vials should be used (filled with sample) within two weeks of preparation.

5.3 Place the 22 cc sample vials directly into the Tekmar 7050 carrousel and program the headspace autosample as described in section 8.2.

5.4 The headspace sampling unit will preheat the vial, mechanically puncture the septum, transfer the sample to the heated sample loop, then inject the sample into the column flow stream via a heated transfer line.

## 6.0 Standards and Calibrations

6.1 Gas standards or liquid standards may by used to achieve calibrations. In some situations it may be necessary to use both types of standards. Certified commercial gas standards are most desirable, but may not always be available for all the compounds or for the concentration levels of the compounds of interest.

6.2 Commercial gas standards are introduced by filling an evacuated 22ml headspace vial with standard gas. The gas standards are placed in the vials and analyzed in the same manner as samples (as described in section 5.0). The concentrations used are those certified by the manufacturer.

6.3 Liquid standard solutions are injected directly into a capped vial and allowed to vaporize. These standards may be produced from high purity compounds as described in Standard Preparation Method SP3 or from commercially available blends in methanol. The liquid standard solutions are placed in vials that meet specifications described in sections 4.1 and 4.2. The vials used must be capped and be at atmospheric pressure when the liquid standard is injected. The standard vial is then analyzed in the same manner as a sample vial as described in section 5.3.

6.4 At the beginning of a project or sample set, standards of appropriate calibration ranges will be run at least two times or until the results agree with a percent standard deviation no greater than 10%.

6.5 Calibration tables should be set up using an external standard method with the Chrom Perfect data system. It is recommended that the calibration table for individual compounds contain at least three standard concentration levels.

6.6 During the course of analyzing samples at least one standard should be run for every 10 samples.

6.7 The instrument response (for any one subsequent standard in section 6.5 above) must not vary by more than 25% from the mean of the initial calibration.

## 7.0 Quality Control

7.01 If the parameters set forth in section 6.6 are not met the analytical program will be terminated until the cause is determined and a solution is effected.

7.02 Before and during sample analysis, instrument blanks (sample loops filled with flush nitrogen) should be analyzed to assure the absence of interferences as described in section 3.0 above.

7.03 Before and during sample analysis, sample blanks (evacuated vials filled with high purity nitrogen, and sample vials from the field filled with ambient air) should be analyzed to assure the absence of interferences.

7.04 Prior to the analysis of a sample set, multiple

standards, at different concentration levels, should be analyzed to establish an initial calibration table. During sample analysis, standards should be run at a rate of 1 for each 10 samples.

7.05 Standards analyzed during the course of analyzing samples are used to monitor individual compound calibration and peak retention time stability. All chromatograms should be examined by an experienced analyst.

7.06 The soil gas sample vial is pressurized at the time of sampling. This pressure preserves sample integrity since any leakage is out of the vial and does not result in contamination or sample dilution.

7.07 Throughout the analysis the headspace gas is injected mechanically from a sample loop to achieve a uniform sample size. The flow through the sample loop comes directly from the sample vial which has been pressurized.

7.08 The headspace sampling unit contains a heated platen as well as a heated sampling loop and transfer line. The latter two zones are continually flushed with nitrogen between sample analyses to minimize the chance of instrumental carry over. This nitrogen in the sample loop is injected periodically to check for instrument contamination.

7.09 Once the headspace vials are punctured in the headspace unit, the sample loop is allowed to equilibrate to atmospheric pressure just prior to injection. This insures that an accurate, equal volume will be injected each time. Each vial is analyzed one time only.

7.10 Calibration records are generated and stored in the computer. All such records will be maintained in the laboratory during the course of the project.

## 8.0 Instrument Conditions

### **8.1 Gas Chromatograph:**

Injection Temp. 220 deg. C.

Flame Ionization Detector Temp. 220 deg. C.

Electron Capture Detector Temp. 375 deg. C.

#### Oven Temp. Program:

Initial temp. 35 deg. C.

Hold 10 min.

Rate 4 deg. min. to 135 deg. C.

Hold .01 min.

Rate 6 deg. min. to 219 deg. C.

Hold 15 min.

Equilibration Time 1 min.

Initial E.C.D. Signal Range 5

Initial F.I.D. Signal Range 4

Carrier Flow Rates: (output of column split)

Head Space Sampler in 12 cc/min.

Make up gas to E.C.D. 76 cc/min.

Make up gas to F.I.D. 34 cc/min.

Total column 12 cc/min.

Hydrogen Pressure 22 psig.

Flame Air Pressure 30 psig.

### **8.2 Headspace Sampler:**

Platen Temp. 75 deg. C.

Valve/Loop Temp. 110 deg. C.

Transfer Line 110 deg. C.

Sample Equilibration time 45 min.

Sampling interval 75 min (remote)

#### Valve Timing:

Pressurize 0.0 min.

Vent/fill loop 0.25 min.

Loop equilibration 0.33 min.

Inject to G.C. 1.0 min.

Carrier Flow 12 cc/min.



**ANALYTICAL METHOD**

**AM9.02**

**ANALYSIS OF VOLATILE ORGANIC COMPOUNDS IN SOIL  
USING STATIC HEADSPACE/DISTILLED WATER**

**MICROSEEPS**



**University of Pittsburgh Applied Research Center  
220 William Pitt Way  
Pittsburgh, PA 15238  
(412) 826-5245**

## ANALYTICAL METHOD AM9.02

### **ANALYSIS OF VOLATILE ORGANIC COMPOUNDS IN SOIL USING STATIC HEADSPACE/DISTILLED WATER**

#### **1.0 Scope and Application**

1.1 Method AM9.02 is used to determine the concentration of volatile organic compounds in soil samples. Specifically, Method AM9.02 may be used to detect the following compounds:

pentane	benzene
hexane	toluene
heptane	m & p-xylene
octane	o-xylene
nonane	ethyl benzene
decane	freon 113
chloromethane	bromomethane
vinyl chloride	chloroethane
1,1-dichloroethylene	fluorotrichloromethane
methylene chloride	1,2-dichloropropane
1,1-dichloroethane	bromodichloromethane
1,2-dichloroethane	cis 1,3-dichloropropylene
trans 1,2-dichloroethylene	trans 1,3-dichloropropylene
chloroform	1,1,2-trichloroethane
1,1,1-trichloroethane	chlorodibromomethane
carbon tetrachloride	chlorobenzene
trichloroethylene	bromoform
tetrachloroethylene	1,2-dichlorobenzene
1,1,2,2-tetrachloroethane	1,4-dichlorobenzene
1,3-dichlorobenzene	acetone

1.2 This method is recommended for use by, or under the supervision of, analysts experienced in the operation of gas chromatographs and in the interpretation of chromatograms.

#### **2.0 Summary of Method**

The volatile organic compounds are analyzed using a Hewlett Packard Model 5890A Gas Chromatograph in conjunction with a Tekmar Model 7000/7050 Automated Headspace Sampler and an H.P. 3396A Networking Integrator. A Supelco, 60M x 0.75mm i.d. Vocol, wide bore capillary column is used in conjunction with an output splitter connected to an electron capture detector and a flame ionization detector. The integrator is interfaced to a microcomputer for data storage and processing. Data transfer and analyses are facilitated using a chromatography data system (Chrom Perfect, Justice Innovations).

### 3.0 Interferences

3.1 Contamination by carryover can occur whenever high-level and low-level samples are sequentially analyzed. The Tekmar 7000 provides continuous flushing of the sample loop and sample valve while in the standby mode between analyses. This flush flow should be maintained and the sample valve and loop should be kept heated.

3.2 The analyst should demonstrate the absence of carryover contamination by analysis of contents of the sample loop when purged with pure nitrogen. This demonstration should be performed prior to the analysis of a sample set and when carryover contamination is suspected (after high samples). In the event that 'ghost peaks' (peaks similar to previous sample) appear when a pure nitrogen sample is analyzed measures should be taken to eliminate the carryover contamination.

3.3 Extra peaks in a chromatogram can be actual peaks from a previous run. Contamination from late eluting peaks can occur when injection to injection time is too short or when the column conditioning program described in section 3.4 is not adequate. The HP 5890A is equipped with a temperature programmable oven which can be utilized to minimize this interference.

3.4 The analyst should be certain that all compounds have eluted from the previous analysis prior to analyzing any sample or standard. This can be accomplished by elevating the oven temperature after an analysis until such time that a clean stable baseline is obtained. If samples or standard chromatograms contain suspected 'extra peaks' the sample should be reanalyzed after a clean baseline is established.

3.5 Other interferences that affect the sample analysis can come from sample vials, vial septums, and equipment used to collect the sample. Before and during sample analysis, sample blanks (empty sample vials, and sample vials with 10ml of distilled water) should be analyzed to assure the absence of interferences.

### 4.0 Materials and Equipment

4.1 Sample vials: 22 ml glass vials (Hewlett Packard #9301-0716 or equivalent). Vials should be free of all interfering compounds prior to use. This can be accomplished by washing and rinsing with hydrocarbon free water followed by heating to 100 degrees C for 1 hour followed by purging with pure nitrogen.

4.2 Septums: Teflon lined septums (Wheaton #224168 or equivalent) may be used.

4.3 Gas Chromatograph: The Hewlett Packard 5890A Gas Chromatograph is equipped with a Supelco, 60M x 0.75mm i.d. Vocol, wide bore capillary column connected to an electron capture detector and flame ionization detector.

4.4 Headspace Sampler: A Tekmar (Model 7000) equipped with a Tekmar (Model 7050) automated carrousel is used. The carrousel contains 50 slots for headspace vials. The vials are automatically transferred from the carrousel to a platen where they are heated and optionally mixed for a preset time prior to injection. The headspace sampler also contains a heated sample valve, heated sample loop and heated transfer line to facilitate transfer of the sample onto the column in the gas chromatograph.

4.5 Data Collection: The output of the chromatograph is directed to a Hewlett Packard (HP-3396A) Networking Integrator which passes the data to a personal computer for data processing with Chrom Perfect software.

4.6 Distilled Water: Interference free.

4.7 Scale: Capable of .01 gram resolution.

4.8 10 ml pipette: Corning 7078D

## 5.0 Sample Preparation and Analysis

5.1 Sample vial preparation: All sample vials should meet specifications as noted in sections 4.1 and 4.2 above.

5.2 To a clean empty vial add, using the pipette, 7 ml of hydrocarbon free distilled water.

5.3 Weigh the vial and water (including the septum and cap).

5.4 Add approximately 5 grams of soil sample to the vial.

5.5 Immediately cap the vial with a crimp-on septum as described in section 4.2.

5.6 Reweigh the filled sample vial and record the weight of the sample added.

5.7 Place the 22 cc sample vials directly into the Tekmar 7050 carrousel and program the headspace autosampler as described in section 8.2.

5.8 The headspace sampling unit will preheat the vial, mix the sample, mechanically puncture the septum, transfer the sample to the heated sample loop, then inject the sample into the column flow stream via a heated transfer line.

5.9 In order to insure sample integrity, with regard to loss of volatile compounds, it is recommended that the sections 5.4 and 5.5 be performed in the field.

## 6.0 Standards and Calibrations

6.1 Standards may be produced from high purity compounds which are blended, then diluted in methanol as described in Standard Preparation Method SP3; or from commercially available blends in methanol, which may be further diluted.

6.2 The liquid standards are injected into vials that meet specifications described in sections 4.1 and 4.2. The vials used should contain 10 ml of distilled water, be capped, and be at atmospheric pressure when the liquid standard is injected. The headspace in the standard vial should be equal to that of a sample vial. The standard should be injected directly into the distilled water. The standard vial is then analyzed in the same manner as sample vials (as described in section 5.3).

6.3 At the beginning of a project or sample set, standards of appropriate calibration ranges will be run at least two times or until the results agree with a percent standard deviation no greater than 10%.

6.4 Calibration tables should be set up using an external standard method with the Chrom Perfect data system. It is recommended that the calibration table for individual compounds contain at least three standard concentration levels.

6.5 During the course of analyzing samples at least one standard should be run for every 10 samples.

6.6 The instrument response (for any one subsequent standard in section 6.3 above) must not vary by more than 25% from the mean of the initial calibration.

## 7.0 Quality Control

7.01 If the parameters set forth in section 6.4 are not met the analytical program will be terminated until the cause is determined and a solution is effected.

7.02 Before and during sample analysis, instrument blanks (sample loops filled with flush nitrogen) should be analyzed to assure the absence of interferences as described in section 3.0 above.

7.03 Before and during sample analysis, sample blanks (empty

sample vials, and sample vials with 10ml of distilled water) should be analyzed to assure the absence of interferences.

7.04 Prior to the analysis of a sample set, multiple standards, at different concentration levels, should be analyzed to establish an initial calibration table. During sample analysis, standards should be run at a rate of 1 for each 10 samples.

7.05 Standards analyzed during the course of analyzing samples are used to monitor individual compound calibration and peak retention time stability. All chromatograms should be examined by an experienced analyst.

7.06 Throughout the analysis the headspace gas is injected mechanically from a sample loop to achieve a uniform sample size. The flow through the sample loop comes directly from the sample vial which has been pressurized by the heating process.

7.07 The headspace sampling unit contains the heated platen as well as a heated sampling loop and transfer line. The latter two zones are continually flushed with nitrogen between sample analyses to minimize the chance of instrumental carry over. This nitrogen in the sample loop is injected periodically to check for instrument contamination.

7.08 Once the headspace vials are punctured in the headspace unit, the sample loop is allowed to equilibrate to atmospheric pressure just prior to injection. This insures that an accurate, equal volume will be injected each time. Each vial is analyzed one time only.

7.09 Calibration records are generated and stored in the computer. All such records will be maintained in the laboratory during the course of the project.

7.10 The possible loss of volatile organics is dramatically reduced when sample preparation is performed in the field as described in 5.7.

## **8.0 Instrument Conditions**

### **8.1 Gas Chromatograph:**

Injection Temp. 220 deg. C.

Flame Ionization Detector Temp. 220 deg. C.

Electron Capture Detector Temp. 375 deg. C.

Oven Temp. Program:

Initial temp. 30 deg. C.

Hold 10 min.

Rate 4 deg. min. to 110 deg. C.

Hold .01 min.

Rate 20 deg. min. to 200 deg. C.

Hold 15 min.

Equilibration Time 1 min.

Initial E.C.D. Signal Range 5

Initial F.I.D. Signal Range 4

Carrier Flow Rates: (output of column split)

Packed Injection Port 2 cc/min.

Head Space Sampler 10 cc/min.

Make up gas to E.C.D. 76 cc/min.

Make up gas to F.I.D. 34 cc/min.

Total column 12 cc/min.

Hydrogen Pressure 22 psig.

Flame Air Pressure 30 psig.

### **8.2 Headspace Sampler:**

Platen Temp. 75 deg. C.

Valve/Loop Temp. 110 deg. C.

Transfer Line 110 deg. C.

Sample Equilibration time 45 min.

Mixing time 8 min. (optional)

Sampling interval 60 min (remote)

Valve Timing:

Pressurize 0.0 min.

Vent/fill loop 0.25 min.

Loop equilibration 0.33 min.

Inject to G.C. 1.0 min.

Carrier Flow 12 cc/min.

**DETECTION LIMITS FOR VOLATILE ORGANICS**  
**METHODS AM4.02 AND AM9.02**

Compound Name	Detection Limit (ppm-v)
Chloromethane	1
Vinyl Chloride	1
Bromomethane/Chloroethane	1
Fluorotrichloromethane	0.005
1,1-Dichloroethylene	0.01
Methylene Chloride	1.0
trans-1,2-Dichloroethylene	0.1
1,1-Dichloroethane	0.01
Chloroform	0.005
1,1,1-Trichloroethane	0.005
Carbon Tetrachloride	0.005
Benzene	0.07
1,2-Dichloroethane	0.01
Bromodichloromethane	0.005
cis-1,3-Dichloropropylene	0.01
Toluene	0.07
trans-1,3-Dichloropropylene	0.01
1,1,2-Trichloroethane	0.005
Tetrachloroethylene	0.005
Chlorodibromomethane	0.005
Chlorobenzene	0.07
Ethyl Benzene	0.07
Bromoform	0.005
1,1,2,2-Tetrachloroethane	0.005
1,3-Dichlorobenzene	0.07
1,4-Dichlorobenzene	0.07
1,2-Dichlorobenzene	0.07

Note

Detection limits for other volatile organic compounds will be determined in the field based upon instrument calibration.